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KNOWLEDGE.

"GET WISDOM: AND WITH ALL THY GETTING, GET UNDERSTANDING."

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BIOGRAPHY.

BIOGRAPHICAL SKETCH OF FELLENBERG.

The following sketch of the life of one who has devoted all the energies of his mind and body for half a century to the promotion of Education, is contained in a letter from himself to the Editor of the Journal of Education.

'MY DEAR SIR—In compliance with your request, I now present you an account of those incidents, which memory suggests as the most striking and characteristic of my life.

'I was born in 1771. I was, if I mistake not, only four years of age, when playing with a small cart, I was forced down a steep declivity, toward a stream of sufficient depth to drown me. At the same time I beheld my mother hastening to my assistance, and endeavouring to arrest the cart. I saw her extended upon the gravelly declivity, still persevering, although covered with blood, in her maternal efforts, without which I should have lost my life. The impression made by this act of devotedness, has never been effaced from my memory or from my heart. I believe it contributed powerfully to direct me in that course of life which I have followed during the last forty years. It was eight years after this event that I saw my mother holding a gazette, in the embrasure of a window, in the castle of Wildenstein, in Argovie, where my father was prefect of the Government of Berne. I saw her weeping bitterly, I ran to entreat her to tell me what occasioned her tears. She at first answered, that she could not tell me, because I should not be able to understand her. Upon my renewed entreaties, she said, that the Americans had lost

a battle, and explained to me, in a manner suited to the understanding of a child of my age, the struggle between the English Government and the freemen of North America. The impression which this account, accompanied by my mother's tears, produced upon me, is among the number of those which exerted a preponderating influence on my youthful developement.

'It was about this time, that I found myself, then twelve years of age, with an old aunt under a large Linden tree before the castle of Wildenstein, attentively observing, while conversing with her, what was passing in the yard. We suddenly saw a man, clothed in a singular manner, with a thick beard and long black hair, ascending the avenue to the castle. My aunt, alarmed at this apparition, sought in her pocket for something to give him, to induce him to withdraw. At the same time I saw my father, who, in the meanwhile had left the castle, hastening with great eagerness to embrace him. My aunt was astonished, and I could hardly wait for a convenient moment to ask my father for an explanation of what seemed so enigmatical in the apparition that had excited my curiosity. I learned, after the departure of this man, equally singular in his conversation and appearance, that, notwithstanding his then repulsive aspect, he was highly distinguished for his benevolent temper and devotedness to the best interests of humanity. It was upon this occasion that I heard for the first time the name of *Pestalozzi*. I had at Wildenstein two tutors, who exerted an influence over me which I shall always remember as a very instructive example. One of them, not having discovered my natural disposition, and not knowing how to impart the instruction which he was to give, tormented and wearied me, and, having driven me to the last extremity, supposed I was under a diabolical influence. This I knew was not the case, although I felt that his suppositions would lead me to open rebellion against this unpleasant Mentor, whose suspicions would have greatly injured me if my parents had not had the good sense to give his place to the excellent Mr. Rengger, since then minister of the interior of the Swiss Republic. But the happiness resulting from enjoying his instructions was of short duration; this, however, did not prevent our becoming intimately acquainted. Mr. Rengger's treatise upon the calender, which appeared in 1788, and his Report of my school for the poor, published in 1815, proved to what an extent our views and affections harmonized together.

'I went a few years after, with my mother, to visit the castle of Konigsfelden, where the nobility of Austria had conspired against the liberty of Switzerland, under the auspices of Queen Agnes. The historical recollections which this place revived, occupied me

attentively. Here, too, I saw contiguous to the Castle of Konigsfelden, a house inhabited by insane persons, who had been generally brought to this state by their bad conduct. The wretched aspect they presented excited my compassion, and my mother, seizing the favourable moment, withdrew with me into her chamber, and there made me take the most solemn vows, never to lose sight of the unfortunate; but always to assist them by all the means in my power. After I had pronounced these vows, my mother knelt down beside me and offered a fervent prayer, beseeching God to enable me to fulfil with fidelity the resolution I had formed. I afterward went to Colmar, to the Institution of the celebrated Pfeffel. I revered him for his goodness; but I soon perceived that a blind man never ought to direct an enterprise of this kind; and while I observed many useful features in this institution, I was struck with many unsuitable things, which should be banished from the sphere of education. Having returned to Berne, my native city, I was at first almost wholly absorbed with the impressions produced by an excellent discourse, delivered by my late father, as president of the Helvetic Society, at its meeting in Olten, upon the necessity of improving our national education. From that time I imbibed a decided taste for those studies which refer to it; but I only found among my young companions at Berne a taste for gaming and dissipation, and when I endeavoured to shelter myself from their pursuit, in the most retired part of the maternal mansion, the furniture of my chamber was heaped up in confusion, by way of revenge for my neglect of them.* About this time, my late father, then a Senator of the Republic of Berne, often said to me, while going to the town-house, that he should defend more successfully the interests of his country, in proportion as he was fully persuaded that I should do so in my turn; and when he returned from the Senate, saddened by the insufficiency of his efforts for the public good, he frequently remarked, that his disinterested views on the subject of his country's welfare received but little support from his colleagues, and observed that we must redouble our efforts, if we would hope, one day, to realize our plans. The aspect of this venerable father of his country, so often grieved by his isolated condition, persevering notwithstanding in his painful duty, made an impression, which was

* At this period, in order to improve his health, which he had impaired by study, he gave up the delicate dishes of his father's table for very simple fare, and employed other means to harden his constitution. He endeavoured to render himself independent of artificial wants, and devoted to benevolent purposes, the money wasted by his companions in luxury and amusement.

only second to the one produced upon my heart by maternal affection, in determining the bent of my future life. I was but sixteen years old, when I entreated my father to permit me to leave my native city, that I might qualify myself to follow his example in the service of my country. My heroic mother frequently spoke to me of her grandfather, the Dutch Admiral Van Tromp, and narrated his exploits, with the assistance of some trophies found among the family relics, one of which, a present from the King of Denmark, represented upon a box of amber all the battles he had won. I was thus roused to a strong degree of patriotic excitement, and I applied myself to the study of the Greek language, and antiquities, with a learned Hellenist, who had imitated the celebrated Hensterhuis, without acquiring his talents. This man was then settled in a country parish, in the canton of Berne, where he had formed a taste for good living, and for the pleasures of the chase, and attempted to persuade me to accompany him, at the very time when I was most desirous of studying. There I beheld all that was repulsive in the pride of learning, and in the exclusiveness of limited views of civil policy, and I finally left him, and retired to the house of a village pastor, in the canton of Argovie. Here I only found less pretensions to erudition, with a slight increase of philanthropy and elevation of soul, in the family in which I hoped to obtain an asylum favourable to the Muses, and the cultivation of those virtues, of which I stood in great need. I then travelled all over Switzerland in search of them, but I nowhere discovered the *beau ideal* which filled my heart, and occupied all the faculties of my soul. I pursued my studies for some time at the German Universities, especially the study of law under one of the most distinguished lawyers, Professor Hofacker, of Tubingen. This good man, to whom I communicated my observations upon his public lectures, advised me not to attend them; but to limit myself to his private instructions. He lamented with me the obligation, which the most learned men of Germany felt under, of adapting themselves to the wants of those practitioners who frequent the universities, for the purpose of obtaining the means of earning a subsistence, without perplexing themselves with the learning, which is only obtained by a rational study of the science. My attention was now drawn towards philosophical and political studies. The intensity with which I applied myself to them injured my health, and led me to wish ardently that an occasion would present itself, in which I might devote myself exclusively to some cause closely united with the best interests of humanity. I afterward travelled again over the different parts of Switzerland, to examine its state, to find means of fulfilling my vows;

but I did not succeed in my aim.* My observations only served to convince me that, with women as well as with men, it was necessary to begin with a well conducted education, to produce, in progress of time, that domestic happiness, and that influence upon the public prosperity, towards which all my desires tended. The dangers with which the French revolution threatened my country, induced me in 1795 to visit France. I arrived in Paris after the fall of Robespierre. I often attended, while there, the meetings of the committee of public instruction, and was truly edified by the philanthropic and indefatigable activity of the Abbe Gregoire. I often saw the Abbe Sieyes, and other leaders of public affairs. From the intrigues which I observed, I could foresee the events which caused Switzerland to yield in 1798. I returned to my native country, with the desire of informing my countrymen of the destiny which awaited them, and of finding some means of averting it. With this object, I wrote several articles in the gazettes, and circulated several pamphlets, in which I sought to convince my fellow-citizens that nothing remained for us but to sacrifice upon the altar of our country those exclusive privileges of the patrician order, which had alienated the affection of the Swiss nation, and to regain their confidence by showing a noble zeal for the safety of our country. I found but few friends disposed to listen to me, and I even passed as a revolutionist. But in 1798 my predictions were verified, and the French invaded Switzerland.'

To this account of himself, the Editor of the Journal of Education adds,—"At the approach of the French troops, sent to overthrow the government of Switzerland, Fellenberg was active in raising and leading on the levy *en masse* from Lucerne to resist them. But the city of Berne was taken, and the cause lost, before any efficient force could be organized. Fellenberg was proscribed, a price set upon his head, and he was compelled to fly to Germany. At this time he designed to come to the United States, and sent some of his funds hither as a resource, in case of the utter ruin of affairs at home. He was, however, soon after recalled to Switzerland, and sent on a mission to

* In these journeys, which formed one of his principal occupations for ten years, it was Fellenberg's leading object to make himself acquainted with *the state of the people*, in order to learn how he could be most useful to them. The writer has been struck with observing how much more familiar he was with the men than with the mountains of his country. He generally travelled on foot, with his knapsack on his back, residing in the villages and farm-houses, and mingling in the labour and occupations, and partakiug of the rude lodgings and fare of the peasants; often extending his journeys to surrounding countries.

Paris to remonstrate against the oppressive conduct of the agents of the French Republic. He was instrumental in procuring an order for the recall of one of the most profligate; but the utter disregard of principle and honesty, which pervaded the public men and public measures of the day, disgusted him with the diplomatic career, and he resigned his office. For a short period after his return home, he occupied a public station; but the want of faith and public spirit, which he found in the government, in executing measures whose direction had been committed to him, confirmed his disgust for political life, and he resolved to abandon it entirely, until a better day should dawn upon his country. His early disappointments in his examination of society—his investigation of the state of the common people—his intercourse with public men, and the convulsions he had witnessed, had all conspired to impress upon his mind the same conviction, that the *only resource* for meliorating the state of his own and other countries, and preventing a repetition of the horrors which he had witnessed, was to be found in *early education*, and he resolved henceforth to devote himself to this as the object of his life. He was appointed a member of the Council of Education of Berne, but was soon convinced that nothing adequate could be accomplished on this subject through the medium of legislative commissions; and, being possessed of an ample fortune, he resolved to devote this to his great object, and to form on his own estate, and on an independent basis, a model institution, in which it should be proved what education could accomplish for the benefit of humanity.' He married, about this time, a Bernese lady of the patrician family of Tscharner, who has borne him nine children, six of whom, as well as their mother, are devoted coadjutors in his plan of benevolence. In pursuance of this great design, 'formed,' as he observed, 'at Paris, in presence of those usurpers who had seized upon his country like a vulture upon its prey,' he purchased the estate called Hofwyl, in the vicinity of Berne, and his subsequent life forms an important page in the records of humanity.

We cannot omit the following testimony to the value of a religious education, contained in the concluding paragraph of this letter, from which we have made extracts. It is the more remarkable, as he preserved this unwavering belief in revelation at a period when Europe was inundated with infidelity. The sincerity and strength of his convictions may be inferred from the efforts he made to convince an unbeliever of his acquaintance, as described in the following extract.

'I have passed over in silence, my dear sir, all that you are already acquainted with: but I cannot forbear mentioning, that I am

also under great obligations to my late esteemed parents, for the cultivation of my religious character. They were both very pious, and Christians, in the full extent of the term, in practice as well as in principle and sentiment. In consequence of their instructions in early life, I have never had any doubts upon the subject of religion. The degree of certainty which accompanied it, was so great, that it appeared to me impossible that an unbeliever could withstand the evidence upon which I grounded my religious belief, when eighteen years old. The unbeliever you spoke of, was forty-eight years of age. He declared that when his mother died, he had seen the complete dissolution of human life, and his relations, distinguished for their religious attainments, had renounced all hope of restoring him to a more cheerful and consoling belief. I was not, however, discouraged; and remained six months in his retreat on the shores of the lake of Zurich, in order to convince him of his error; but I failed to enlighten him as completely as he failed to darken my mind. Many other circumstances contributed to throw light upon the subject of religion, and confirm my belief. It appears to me unnecessary to add any thing to this account, which must be succinct to fulfil its aim.'

BIOGRAPHICAL SKETCH OF COLUMBUS.

"The narrative of the troubled life of him who first had the judgment to divine, and the intrepidity to brave the mysteries of the perilous ocean" in search of a continent, "and who, by his hardy genius, his inflexible constancy, and his heroic courage, brought the ends of the earth into communication with each other, is the link which connects the history of the old world with that of the new." To no individual inhabiting the continent which was thus, by his penetrating sagacity and persevering boldness, made known to the old world, no, not even the solitary native whose lodge has never yet been disturbed by the presence of a white man, is this event, or the life of the extraordinary man by whose agency it was accomplished, uninteresting; and we shall therefore make no apology for giving the following biographical sketch of Columbus, compiled principally from the history of his "Life and Voyages," by our countryman, Washington Irving.

When and where Columbus was born, is a question which seems not to be fully settled, though the better authority fixes the date of his birth about the year 1435, or 1436, and assigns the city of Genoa as the place of his nativity. "More than one noble

family," observes Mr. Irving, "has laid claim to him since his name has become so illustrious as to confer rather than to receive distinction," but it does not appear that his family had ever been distinguished either for wealth or public services; on the contrary, it seems to be satisfactorily established, that his father, though respectable, was in rather indigent circumstances; but so far is this fact from detracting from his merits, it rather adds to the glory of his achievements, and heightens the lustre of his name. In speaking of his ancestry, his son and biographer very philosophically remarks, that he does not think it any dishonour to those who descended from him, that his family was obscure, and had been seafaring people, "because," says he, "I think it better that all the honour be derived to us from his person, than to go about to inquire whether his father was a merchant, or a man of quality, that kept his hawks and hounds; whereas it is certain there have been a thousand such in all parts, whose memory was utterly lost in a very short time among their neighbours and kindred, so as it is not known whether there even were any such men; but I am of opinion that I should derive less dignity from any nobility of ancestry than the honour I received from being the son of such a father."

The original name of Columbus, was Colombo, which he latinized into that by which he is now distinguished. In his tender years he was taught to read and write,—to draw and paint:—he was subsequently sent to the school at Pavia, then a celebrated seminary of learning, where he acquired a knowledge of grammar; the Latin language; geometry; geography; astronomy, or as it was then called, astrology; and navigation. Having at a very early age evinced a strong predilection for a sea-faring life, he pursued with ardour every branch of science that could be of service to him in his future profession.*

"In tracing the history of such a man as Columbus," says Mr. Irving, "whose actions have had so vast an effect on human affairs, it is interesting to notice how much has been owing to the influence of events, and how much to an inborn propensity of the mind. The most original and inventive genius grows more or less out of the times; and that strong impulse which Columbus considered as supernatural, is unconsciously produced by the operation of external circumstances. Every now and then, thought takes some sudden and general direction, either revisiting some long neglected region of knowledge, and exploring and re-opening its forgotten paths, or breaking with wonder and delight into some fresh and untrodden field of discovery. It is then that an ardent and imaginative

* Irving.

genius, catching the impulse of the day, outstrips all less gifted cotemporaries; takes the lead of the throng by which it was first put in motion; and presses forward to achievements, which feebler spirits would never have ventured to attempt." "We find in Columbus an illustration of this remark. The strong passion for geographical knowledge which he so early felt, and which gave rise to his after actions, was incident to the age in which he lived. Geographical discovery was the brilliant path of light, which was for ever to distinguish the fifteenth century; the most splendid era of invention in the annals of the world." At this time science and letters began to revive, and knowledge dawned upon long benighted Europe; but though this knowledge was limited and imperfect, yet, like the return of morning light, it was full of interest and beauty. It seemed to call a new creation into existence, and broke with all the charm of wonder upon imaginative minds. They were surprised at their own ignorance of the world around them. Every step seemed discovery, for every region beyond their native country was in a manner terra incognita."*

Such was the state of the world, at the time when Columbus left Pavia; and being of a sanguine temperament, and possessing an ardent and imaginative mind, no wonder he should imbibe a large share of the spirit of enterprise and discovery which then animated all Christendom, and especially the maritime and commercial class, among whom nearly all the Genoese must be ranked. His youthful mind must have been fired by the relation which he had of new discoveries, and excited by the accounts of naval battles and engagements, which were at that time of every day occurrence in the Mediterranean, and in which the Genoese, as the rivals and enemies of the Venetians, were frequently engaged.

Thus impelled, at the age of fourteen, he entered upon that profession in which he at length acquired such honour and renown. Of his early life, after this period, little is known; his son, Fernando, states that he sailed in a naval expedition which was fitted out at Genoa, in 1459, by John of Anjou, against the kingdom of Naples, with a celebrated admiral of his own name, who has been stated to be his uncle, and with whom it appears he continued several years.

A seafaring life was not in those days a mere pastime—a voyage of pleasure upon a smooth unruffled sea,—but it was a life "made up of hazardous voyages and daring enterprises;" every commercial expedition was a warlike cruise, and the mariner was obliged to go prepared to meet danger, and oftentimes to fight his way to

* Irving.

the destined port.* In this school of hardy enterprise, and deadly conflict, did Columbus acquire "that practical knowledge, that fertility and resource, that undaunted resolution, and that vigilant self-command," for which he was subsequently so distinguished, and which undoubtedly enabled him to vanquish difficulties, and overcome obstacles in after life, which to one nurtured in the lap of idleness and luxury, or even in a less severe school of experience, would have been insurmountable. In speaking of his character, Mr. Irving very eloquently remarks, that "he was one of those men of strong natural genius, who appear to form themselves; who, from having to contend at their very outset with privations and impediments, acquire an intrepidity to encounter, and a facility to vanquish difficulties, throughout their career. Such men learn to effect great purposes with small means, supplying this deficiency by the resources of their own energy and invention."

The next authentic account which we have of Columbus, is derived from a letter written by him many years after to the sovereign of Spain. "It happened to me," he observes," that King Reinel sent me to Tunis to capture the galley Fernanda, and when I arrived off the island of St. Pedro, in Sardinia, I was informed that there were two ships and a carrack with the galley; by which intelligence my crew were so troubled that they determined to proceed no farther, but to return to Marseilles for another vessel and more people. As I could not by any means compel them, I assented apparently to their wishes, altering the point of the compass and spreading all sail. It was then evening, and next morning we were within the cape of Carthagena, while all were firmly of opinion they were sailing towards Marseilles." The account given of this enterprise is important, as showing that perseverance and determination to accomplish whatever he undertook, which characterized his subsequent life, and which ensured the success of his undertakings. Not long after this, it appears by the account of his son Fernando, Columbus entered the service of Columbus *Junior*, as he was called, being the nephew of the admiral of that name before mentioned, a famous corsair of his time, and so terrible for his exploits against the Moors, that mothers used his name to frighten their disobedient children. In this rather questionable service, he was distinguished for his intrepidity and contempt of danger; and on one occasion, seems to have fought with a courage bordering on desperation. Having heard that four Venetian galleys richly laden were returning from Flanders, Columbus *Junior* and our adventurer sailed in search of, and fell in with them, off the coast of Portugal. A desperate battle en-

* Irving.

sued, which lasted from morning till night, during which, having grappled his ship, as was then the custom, to one of the largest of the enemy's vessels, both crews fought till the vessels taking fire, they were obliged to throw themselves into the sea, and attempt to gain the shore, as the only chance of saving their lives. Columbus being an expert swimmer, and having the good fortune to get hold of an oar, gained the shore, which was about two leagues distant.*

Columbus being much exhausted, and finding himself destitute on reaching the shore, directed his steps towards Lisbon, not far distant, where he knew many of his countrymen were settled, and where he soon arrived and settled himself.

Such is the account given of the circumstances of his first arrival in Portugal, by his son; but its truth is questioned by Mr. Irving, who states that the battle here spoken of did not take place till some years after his arrival in that country, and considers it more probable, that his first visit to Lisbon, instead of being the fortuitous result of a desperate adventure, was caused by the attractions of the great maritime enterprises in which it was known to all Europe that Portugal was at that time engaged, and in which it is probable that Columbus was desirous of being engaged, and ambitious of acquiring both honour and emolument. But whatever may have brought him there, he arrived about the year 1470, and soon after married a lady of rank, who was the daughter of Monis de Palestrello, then lately deceased, and who had been one of the most distinguished navigators under Prince Henry, the noble and munificent patron of nautical and geographical science, and had colonized and governed the Island of Porto Santo. By this union, which seems to have been one of mutual affection, Columbus became possessed of the maps, charts, and journals of his father-in-law; the perusal of these, and the conversations he had with his brother-in-law, Pedro Correo, raised within him an irresistible desire of visiting unknown countries. From this time, for a number of years, he appears to have been engaged in voyages of traffic to the islands of Madeira, the Canaries, and the Azores; he also made several voyages to the settlements of Guinea, and soon became one of the most skilful navigators of Europe.

The grand object of navigators at this time, was to discover a route by sea to India; but while others more cautious and timid, crept along the shores of Africa in search of it, Columbus conceived the idea of launching into the then unknown, and supposed to be boundless Atlantic, in pursuit of it. Having once conceived the idea that the Indies might be reached by pursuing a western route,

* Life of Columbus, by his son.

it soon, from mere conjecture, grew into a belief, and from belief, ripened into an ardent and immoveable conviction. The theory which he had formed was, that the earth was a terraqueous globe, and might be circumnavigated, and consequently that a navigator, whether sailing east or west, might reach the Indies, though Columbus believed the western would be much the shortest voyage. In this theory he was fortified by the writings of Aristotle, Pliny, and Strabo, who considered the ocean but of moderate width, so that the Indies might be reached by a western voyage of a few days. But he seems to have been more strongly influenced by a letter which he received in 1474, from Paulo Toscanelli, a learned Florentine physician, and a man of great celebrity, as a cosmographer. Toscanelli, in reply to a letter from Columbus, encouraged him to seek India by a western route, assuring him that the distance could not be over 4000 miles in a direct line from Lisbon to the province of Mangi, since ascertained to be the northern coast of China, and giving a magnificent description of the wealth and splendour of the Island of Cipango, which was so abundant in gold, that the palace of the king was covered with plates of it. "It is singular," says Mr. Irving, "how much the success of this great enterprise, (the discovery of America,) depended upon two happy errors, the imaginary extent of Asia to the east, and the supposed smallness of the earth; both errors of the most learned and profound philosophers; but without which, Columbus would hardly have ventured into the western regions of the Atlantic, in whose unknown, and perhaps immeasurable waste of waters, he might perish before he could reach a shore."

Several years seem to have elapsed after Columbus had become firmly convinced of the practicability of discovering land in the western regions of the Atlantic, before any steps were taken towards testing the truth of his theory. It is stated, but upon what authority we know not, that the project of discovering a passage to India by a western route, was first submitted to his native Republic, Genoa; but the first proposition of which there is any authentic account, was made to John II. king of Portugal, who gave it an attentive hearing, and referred it to a council composed of some of the most learned men of the kingdom. This council, however, pronounced the project to be visionary and extravagant, nor was the report of a second council, appointed for the same purpose, any more favourable to Columbus. But the king, at the suggestion of

one of the councillors to whom the matter was referred, after obtaining from Columbus a detailed plan of his proposed voyage, together with his charts, &c. privately despatched a caraval in search of the promised land. This vessel, after sailing a few days westward from the Cape de Verd islands, put back again, and the pilots ridiculed the idea of ever finding land in that direction.

The indignation of Columbus was roused by this mean and unworthy attempt to rob him of the honour of the contemplated discovery, and he immediately left the kingdom in disgust, and passed into Spain, 1484, notwithstanding the disposition manifested by the king to comply with his wishes. At this time he appears to have been reduced to poverty, for we find him travelling into Spain with his little boy, (his wife being some time dead,) on foot, and even asking at the gate of a convent for a little bread and water for his child. Here, however, his appearance attracted the notice of Juan Perez de Marchina, the worthy guardian of the convent, who detained him as his guest, and the acquaintance soon ripened into confidence and friendship. Having unfolded his views to this man and some others, seafaring men, and men of nautical information, they were struck with the boldness of his views, and what was of greater importance to him, so firmly convinced of their correctness, as to offer any assistance which might be necessary to enable him to proceed to the court of Ferdinand and Isabella, for the purpose of submitting his plans, and soliciting their aid in the enterprise. For several years Columbus followed the court of the Spanish sovereigns without being able even to obtain an audience of the king, who was fully occupied by the conquest of Granada: and the impediments, the scoffs, jeers, and ridicule he met with, while thus dancing attendance on their Majesties, and vainly endeavouring to gain access to the royal ears, would have discouraged and disheartened a less persevering or enthusiastic person. At length, however, he had the good fortune to attract the attention of Gonzalez de Mendoza, archbishop of Toledo, and grand cardinal of Spain, who was pleased with his noble and dignified demeanour, and his interesting conversation, and who at length procured him an audience. Ferdinand was so much pleased with Columbus, that he ordered him to submit his views to an assembly of the most learned men in Spain, which were assembled at Sala-

manca, for the purpose of hearing and deciding in regard to them. Before this assembly of learned men, Columbus, says Mr. Irving, "was assailed with citations from the Bible, and the works of the early fathers of the church, which were thought incompatible with his theory: doctrinal points were mixed up with philosophical discussions, and even mathematical demonstration was allowed no truth, if it appeared to clash with the text of Scripture, or commentary of one of the fathers." The council of Salamanca were some years in coming to a decision on the subject which had been proposed to them, during which Columbus remained in a state of anxious suspense, which, to one of his ardent temperament, must have been exceedingly trying. At length, however, upon his urgent solicitations, a decision was made, but as might be expected from men who could oppose science with bigotry, it was adverse, and he was thus again doomed to endure the mortification of disappointment and chagrin.

Columbus now left the court in disgust, and began to look to other quarters for that assistance which he had been unable to obtain from the Spanish sovereigns. His scheme had been submitted to the kings of France and England, by his brother Bartholomew, from whom, as well as from the king of Portugal, he had received letters requesting his attendance at their respective courts. But having married a Spanish lady, by whom he had already several children, he seems to have been reluctant to leave Spain: he was, however, on the point of doing so, when his friend, the worthy Friar Perez de Marchina, who received him as a guest on his entering Spain, warmly remonstrated against such a step, and finally prevailed on him to delay his departure till he could write to the Queen, whose confessor he had formerly been, and whom he hoped to prevail upon to give Columbus a favourable hearing. In reply to his letter, Isabella requested him to repair to court, which he did without a moment's delay, and his honest zeal, and unaffected eloquence, induced her to send for Columbns.

The King and Queen were then in camp before Granada, where he arrived in time to witness the surrender of the Moorish capital into the hands of the Spanish sovereigns. "He beheld" observes Mr. Irving, "Boabdil el Chico, the last of the Moorish Kings, sally forth from the Alhambra, and yield up the keys of that favourite seat

of moslem power; while the King and Queen, with all the magnificence of Spain, moved forward in proud and solemn procession, to receive this token of submission. It was one of the most brilliant triumphs of Spanish history. The air resounded with shouts of joy, with songs of triumph, and hymns of thanksgiving. On every side were beheld military rejoicings, and religious oblations. The court was thronged by the most illustrious of that warlike country, and stirring era; by the power of its nobility, the most dignified of its prelacy, by bards and minstrels, and all the retinue of a romantic and picturesque age."

"During this brilliant and triumphant scene," says an elegant Spanish writer, "a man, obscure and but little known, followed the court. Confounded in the crowd of importunate applicants, and feeding his imagination, in the corners of antichambers, with the pompous project of discovering a world, he was melancholy and dejected in the midst of the general rejoicing, and beheld with indifference, almost with contempt, the conclusion of a conquest which swelled all bosoms with jubilee, and seemed to have reached the utmost bounds of desire. That man was Christopher Columbus."

At length, however, the moment arrived when the negociation was commenced, but it was soon ended by the refusal of the monarchs to comply with the terms of Columbus, who, though reduced to the extreme of poverty, and the subject of ridicule to a large portion of the court, refused to yield a single point, or to accept of terms which he considered beneath the dignity of the enterprise, and actually took his departure, a second time, with the intention of proceeding to France. The generous spirit of Isabella, however, was aroused, and she determined to undertake the enterprise; and as the royal treasury was exhausted, she declared her intention to pledge her jewels to raise the necessary funds. "This" says the elegant Mr. Irving, "was the proudest moment in the life of Isabella; it stamped her renown for ever as the patroness of the discovery of the New World." Columbus, who had already gone more than two leagues from the city, was recalled by a courier sent after him, and treated with a benignity and kindness that in some degree made amends for the past, and a stipulation in writing was entered into, between him and the Spanish sovereigns, on the 17th day of April, 1492, to the following effect:—

1. That he should have for himself during his life, and his heirs and successors for ever, the office of high admiral in all the seas, lands, and continents, he might discover, with similar honours and prerogatives to those enjoyed by the high admiral of Castile.

2. That he should be viceroy and governor general over all the said lands, and continents, with the privilege of nominating three candidates for the government of each Island or province, one of whom should be selected by the sovereigns.

3. That he should be entitled to one tenth of all the free profits, arising from the merchandise and productions of the countries within his admiralty.

4. That he, or his lieutenant, should be the sole judge of all causes and disputes arising out of traffic between those countries and Spain.

5. That he might then, and at all after times, contribute an eighth part of the expense of expeditions to sail to the countries he expected to discover, and should receive in consequence an eighth part of the profit."

Having obtained an order from their majesties to the authorities of the town of Palos, to fit out and man three caravals, which were to be placed under his command, Columbus lost no time in seeing it executed, though such was the horror of the people at the idea of launching into what they considered an unmeasurable waste of waters, and the reluctance of mariners to enter upon an expedition devoted, as they conceived, to certain destruction, that he found it impossible, even with the threatenings of the severest punishment of those who should refuse to obey the royal order, to obtain a crew, nor is it probable he would have succeeded at all, but for the timely and important assistance of Martin Alonzo Pinzon, a wealthy and distinguished seaman, who came forward, furnished two vessels, engaged personally in the expedition, and by his own example and influence induced others to enlist. At length, however, after much delay, and surmounting innumerable and perplexing difficulties and impediments, many of which were purposely thrown in his way for the express purpose of putting a stop to the expedition, Columbus had completed, in the best manner he could, his preparations, and put to sea on the 3d day of August, 1492. The squadron which had thus been fitted out, and which was about to launch into a re-

gion where man had never before ventured, consisted of three vessels, two of which were light barges, called caravels, which were without decks in the centre: the other vessel was decked. The whole number of persons which embarked in the expedition was one hundred and twenty.

Columbus was now upon the broad and trackless deep, and if the difficulties with which he had for the last eighteen years been struggling, and which he had finally vanquished, were great, those with which he had now to contend, though of a totally different nature, were far more trying; he had to deal with ignorant, timid, impatient, and intractable men, whose fears and apprehensions were more and more excited, as they advanced further and further from land, and as the chances of returning to their homes, and of again seeing their friends, were, as they believed, diminishing. The fears of the crews at length broke out in murmurs, and to murmurs succeeded mutiny and menaces. Columbus had used every possible means to allay the fears and excite the hopes of his men—soothing some with gentle words—and stimulating others by the bright prospects of wealth and honour; while the most turbulent, were threatened with punishment; but at last, when the crews seemed to be on the point of consulting their own safety, and returning, signs of land appeared to revive their spirits, and arouse their hopes; these signs became more and more numerous and unequivocal, till on the 12th of October, about two o'clock in the morning, the gun of the foremost vessel, Pinta, which was ahead of the others, gave the joyful signal of Land! "The thoughts and feelings of Columbus" says the author whom we have so often quoted, "in this little space of time must have been tumultuous and intense. At length, in spite of every difficulty and danger, he had accomplished his object. The great mystery of the ocean was revealed; his theory, which had been the scoff of sages, was triumphantly established; he had secured to himself a glory which must be as durable as the world itself. It is difficult even for the imagination to conceive the feelings of such a man, at a moment of so sublime a discovery."

The land which was seen, proved to be an island, to which Columbus gave the name of San Salvadore, which it still bears. The vessels were anchored a short distance from the shore, while the natives were seen issuing from the woods, and running to and

fro, in the greatest wonder and astonishment. Having manned the boats, Columbus, richly attired in scarlet, and bearing the royal standard, approached the shore, landed, threw himself on his knees, kissed the ground, and returned thanks to the Almighty, with tears of joy. His example was followed by all his companions, whom he now caused to take an oath of obedience to him as admiral and viceroy, and representative of the Spanish sovereigns.

His followers now burst out into the most extravagant expressions of admiration and devotedness : those who had been most turbulent and mutinous, were now most humble and abject in there submission, and loud and fulsome in their flattery. The natives, who had fled on the approach of Columbus and his followers, now returned, and being soothed by gentleness, and gratified by the present of some trinkets, an intercourse and good understanding was soon established with them. They were entirely naked, and were painted with a variety of colours and devices, so that they presented a wild and fantastic appearance. Columbus, supposing that he had landed on an island at the extremity of India, gave the natives the general appellation of Indians, which they have retained to the present day.

After spending a few days at this Island, Columbus sailed in search of others, which the natives by signs had given him to understand lay to the south, and which he expected to find abounding in gold, spices, and precious stones. In his route he discovered several Islands, and on the 28th of October came in sight of Cuba, along which he coasted for many days, occasionally landing in search of wealth and civilized beings, neither of which could be found ; but he was greatly pleased with the fine harbours and rivers with which the island abounded. Coasting along this island to the east he discovered the high mountains of Hayti, to which he immediately sailed.

On the 6th of December Columbus entered a harbour at the western end of the island, and from thence he coasted along the northern side of it towards the east, occasionally landing, as he had done on the other islands, and establishing a friendly intercourse with the natives. At length he had the misfortune to have one of his caravels wrecked, which obliged him to land and take up a temporary residence on shore ; the people he found extremely gentle and peaceful, and anxious to render him every possible assistance in

their power, not showing the least disposition to pilfer of the articles which they assisted in removing from the stranded vessel to the place prepared to receive them, though many of them must have possessed an inestimable value in their eyes. Here the admiral was detained for some time, and so much pleased were some of his crew with the mode of life of the natives, that they determined on abandoning their own country, and taking up their residence among these innocent and happy people.—To this Columbus consented, and having built a fort for their protection, and collected a considerable quantity of gold in exchange for trinkets, he set sail on the 4th of January, 1493, on his return to Spain.

On his return, Columbus encountered a violent storm, which raged with such fury that all expected to go to the bottom; anxious that his discovery should be known to the world, even in case the vessels and crews should be swallowed up, he with admirable presence of mind retired to his cabin, and wrote a brief account of the circumstances of the voyage and of his discoveries: this account was placed in the centre of a cask of beeswax, and this again headed up in another cask, and committed to the waves, in hopes that in the event of his being lost, chance might throw it into the hands of those by whom the information might be given to the world. But fortunately for the world, the knowledge of this important event was not destined to depend on a contingency which we believe has never yet happened, and is certainly not likely to happen—the reception of this written account; the storm abated the same evening, and in a few days the vessels came in sight of land, which proved to be one of the Azores. After leaving this island he was overtaken by another tempest, which forced him to take shelter in the mouth of the Tagus, from whence he despatched a courier to the King and Queen of Spain, with an account of his discovery. For several days, so great was the curiosity to see the discoverers of a new world, and the curiosities which they had brought with them, among which the natives on board were by no means the least, that the river was constantly covered with boats filled with people, among whom were many officers of the highest distinction, coming to, and going from the vessels. Columbus was invited to court, where he was treated with the most marked distinction by the King, who ordered that every thing he might want should be furnished free of expense, and

on his return to his vessels he was escorted by a numerous train of cavaliers of the court. The weather in the meantime having become favourable, Columbus again put to sea on the 13th of March, and arrived safely at Palos in Spain, from whence he had sailed, on the 15th, having been absent about seven months and a half.

Nothing could exceed the splendour of Columbus's reception: his journey to Barcelona, where the court then was, was like a Roman triumph; wherever he went, so great was the anxiety to behold him, that the streets were so filled as to be almost impassable. On his approaching the Spanish sovereigns, they rose from the throne on which they were seated, and ordered him to seat himself in their presence. He then gave an account of his voyage, and exhibited the various productions which he had brought from the new world. "When he had finished," says Mr. Irving, "the king and queen sank on their knees, raised their hands to heaven, and poured fourth thanks and praise to God. All present followed their example; a deep and solemn enthusiasm pervaded that splendid assembly, and prevented all common acclamations of triumph."

Columbus still supposed that Cuba was a part of the Asiatic Continent, and that the adjacent islands were in the Indian seas, and he therefore denominated them the West Indies, which appellation was universally adopted.

(To be continued.)

EDUCATION.

COMMON SCHOOLS, NO. 1.

It is somewhat striking, and on a first view appears somewhat inconsistent, that, while for a few years past new principles have been rapidly developing in the different sciences; our systems of instruction, by which a knowledge of these sciences is discriminated, still retain the unbending and forbidding features of a less improved, not to say a less improving age.

This article pretends not to a discussion of the course of discipline pursued in our Colleges, though this subject has furnished,

and until a radical reform shall have been brought about, will continue to furnish matter for just and elaborate criticism. Our COMMON SCHOOLS being as they are, in fact, the nurseries of the infant mind, lay a primary claim to consideration. To them, therefore, the remarks that follow will be devoted, premising that they are not designed to embrace the whole of a subject necessarily so extensive in its details, as to swell an essay purporting a thorough investigation of it to the size of a volume.

All are aware that subsequent improvement in any and every department of science depends mainly upon the impetus given in the acquisition of its first elements. On this fact may be predicated the inquiry, whether the course of instruction generally pursued in our common schools is the best calculated to ensure the proficiency of the pupil in those branches of science coming ordinarily within its range.

That it is not, must to a certain extent be admitted, even by those who are most strongly wedded to things as they are. Indeed a glaring defect presents itself at the very commencement of this inquiry, in the Class Books from which the first elements of reading are taught, which, to speak generally, are far better adapted to minds highly cultivated than to the comprehensions of children.

As an imposing illustration of this fact, instance the ENGLISH READER, a book deservedly celebrated for the highly classical selections with which its pages are enriched; yet what child, as he has conned his daily task from that book, ever thought of admiring a sentiment it contains? When I say not one, or at least very few, the position must I think be supported by general observation, and the experience of every one upon whose memory the impressions of his school-boy days yet linger. Let the finest sentence of the finest extract that the English Reader comprises, be punctuated in such a manner that a full stop shall fall in the middle of it; the victim of common school discipline would drop his voice, *secundem artem*, at the sign of what he had been taught to consider a period, and pass on without discovering that his reading had made sense nonsense.

This utter recklessness of ideas must not, however, be understood as characterizing the reading of children on all subjects. Dissertations on benevolence, virtue, gratitude, and the like, with which our Class Books are commonly filled, are too abstract in their nature to meet the comprehension of the child. They are moreover couched

in language by no means common to his ear; and to expect that he would read intelligibly, under such circumstances, would be much like expecting that a novice in the Latin would read a sentence from Cicero or Livy, with the proper emphasis and cadence, with the import of which he was partially or entirely unacquainted. Substitute, however, a simple story or fable, and the case is entirely altered; if a habit of monotonous reading be not already formed, he will be found to read it intelligibly, and to be responsible for the ideas which it conveys. What child ever read Webster's Spelling Book that could not, immediately, and even ten years after, tell both incident and moral to "The Fable of the old Man and the rude Boy;" "The Maid and the Milk Pail?" &c.

From what has been said, it may be inferred that the fact that the child acquires no ideas from what he reads, is but half the objection to our Common School Reading Books.

They render him a lifeless, drawling reader. Hence a principal reason why good readers are rare. This lifeless drawl is seen subsequently characterizing the declamation of the youth at the Grammar School, and of the young man at College. Nor does the evil end here. Like destiny it pursues its victim from the college cloister to the walks of public life. Its influence is clearly perceptible in the pulpit, at the bar, and in our halls of legislation. Aside, however, from its pernicious effects upon us, as readers and speakers, it engenders a habit of skimming superficially over what we read, of sounding words without pretending to sound their meaning. This above all is to be deprecated, as it is equally the bane of proficiency and correctness in scholarship.

Defects like these certainly demand the application of a remedy. That remedy must be the substitution in our schools of elementary instruction, of a set of Reading Books, far simpler, and better adapted to the comprehension of children from five to fourteen years of age, than the generality of those now in use.

In reading or speaking, the nearest approach to the natural tones of conversation, is, perhaps, the nearest approach to perfection. All will appreciate this who have felt the captivating power of our most finished public speakers, if they have attempted an analysis of the cause that made them feel.

To make natural readers, then, Class Books should be made up of

such selections as tend most to encourage in pronunciation the freedom of the conversational tones, with a style sufficiently simplified to be clearly intelligible to the infant mind. A collection of tales and dialogues would seem best adapted to subserve this end; primarily as simple as possible in language and idea, increasing gradually, however, in the refinements of style and sentiment, in proportion as the child's capacity to comprehend should become enlarged.

For purposes of economy, and to excite and gratify puerile ambition by the present of a new book, reading lessons might be classed into several distinct sizes, and bound separately.

To the general adoption of a reform in substance like the foregoing, in the reading department of our common schools, there is but one objection, and that exists mainly in the repugnance of parents to incur the expense of making a substitution of new Class Books for the old.

That an error so palpable should so long have remained unremedied, is to be imputed to the sanction and authority of great names, and a repugnance to innovation, but the origin of it is only referable to an almost unpardonable oversight in the compilers of juvenile lessons in supposing, or at least, acting on the supposition, that they were collecting food for minds strengthened by years, by extensive reading, and much reflection.

On a future occasion it is purposed to add some remarks on the modes of instruction pursued in our Elementary Schools, in which, though the defects may be equally palpable, and the remedy equally obvious, the application of it may be more difficult, inasmuch as not books only, but teachers will in many instances require modification, and it is perhaps unnecessary to state that books and men are not made or modified with the same facility. W.

To the Editors of the Magazine of Useful and Entertaining Knowledge.

GENTLEMEN,—

HAVING sent me the previous numbers of your useful Magazine, you may consider me, for the future, as one of your subscribers, and

if possible I shall send you now and then a short article. The following was suggested by the card of Capt. Partridge, lately published on Physical Education, which I hope you will embody in your valuable work.

The subject of Physical Education has been noticed slightly in some of our periodicals, but it is one of too much importance to be forgotten, or placed even in the back ground of a system of Education. Education has embraced in its meaning simply mental and moral culture, but this is deducting very much from the original meaning of the word, which consists, says a great scholar, in EDUCING the FACULTIES and forming the HABITS. The faculties of the mind are far from being in a healthful state, unless those of the body are duly preserved: the connexion between the habits and the physical man is so great that it is impossible to form the one without regulating the other. Hence the mind is of little value to man, simply as man, unless his physical power is capable of enduring fatigue, and surmounting those difficulties which throw themselves in almost every one's way.

If then the mind is valuable to man in a ratio as his body is vigorous, arguments are not needed to prove that Physical Education should be studied even as a science. The mind cannot say to the body, I have no need of thee, neither can the body say to the mind, I have no need of thee. "United they stand, and divided they fall." Aye, many a young man, whose prospects were among the most flattering, has been stopped in his career by neglecting his physical nature. By physical nature, we mean all those powers of body which are useful or necessary in the performing of the functions of animal life; by physical education, we mean the proper balance of these powers, insomuch that the whole animal frame may be preserved in a healthful and perfect state, while the mind is labouring to fill her storehouse for all future time. The *manly* machine is constituted so perfectly, that her own peculiar and, legitimate movements become her curatives for disease, her preventives against sudden decay.

True, disease may be, and often is entailed, not simply upon one generation, but many, and on this account it becomes exceedingly difficult to prescribe any rules which will bear with perfectness on any one class of intelligent beings. Yet this truth by no means

prevents the study of the animal economy, but rather demonstrates the necessity of analyzing our nature more carefully, that we may not only prevent the dangers to which we are exposed by our peculiar situation, but the vices which have come down to us from those who should have left us a better legacy. All these dangers and evils may be guarded against, and to a certain extent prevented, although the author of our being has declared, that as "from dust we are, unto dust we shall return." This we are far from denying, and we find by the numbering of our friends oft a painful evidence of its truth; still by following a simple course of life, with judicious and proper exercise, the animal existence may in most instances be very much prolonged, and the whole current of life be more tranquil and serene—storms doubtless will rise; yet a firm constitution and good health will often triumph over the most violent ragings of disease.

"In the month of March, 1828, I communicated to the public through the medium of the National Intelligencer, an account of some of my pedestrian excursions, accompanied by remarks, pointing out the great advantages of *walking*, both as a most healthy exercise, and also enabling us to discharge with greater facility and despatch most of the ordinary duties of life. Since that time I have performed several other similar tours, (for scientific purposes,) the principal of which are as follows:

1st. In the month of June, 1830, I made a *pedestrian* excursion of about 300 miles, ascending, in the course of it, Mt. Anthony, near Bennington, Saddle Mountain, in Mass., and some other eminences, and visiting the battle grounds at Bennington and Stillwater, and also the interesting military positions in the vicinity of Lake George. The last day of this excursion I walked from Middlebury to Norwich, a distance of 64 miles. I carried a knapsack weighing about twenty pounds, also my barometer, thermometer, &c., and, during this day's march, crossed the Green Mountain range, it being an ascent and descent of more than 1600 feet perpendicular. The day was one of the warmest during the summer.

2nd. In the month of September last, I walked from Norwich to the summit of the Grand Monadnock, and returned in 3 days—it being 152 miles. The distance walked each day was as follows viz.

1st day	55 miles.
2d day, including the ascent and descent of the mountain,	42
3d day	55
Average distance walked each day,	50 1-3

3d. In the early part of the present month, (October) I made an excursion, on foot, to the summit of Mount Holyoke, near Northampton, and some other eminences in that vicinity. The distance walked in four days was 220 miles, and the distance walked each day was as follows, viz.

1st day,	70 miles.
2d day,	44
3d day,	45
4th day,	60
Average distance walked each day,	55

One day was spent in visiting Mount Holyoke, &c. and is not included in the above. I was absent on the last excursion, five days. All the excursions were performed as it were, on the spur of the occasion, without any preliminary training, or preparation, or any change of my every day exercise, or mode of living. Amongst the many important advantages that I feel I have derived from combining regular, and in some instances severe exercises with study, is the enjoyment of almost uninterrupted good health. I am now, and always have been, entirely free from those debilitating affections, under which so many of our literary men have sunk, and are fast sinking. I know nothing of that *fashionable* disorder called *Dyspepsia*, except the name. My appetite is uniformly good, and I seldom enjoy less than eight hours of sound sleep out of the 24. I have within 20 years ascended and measured nearly all the principal mountains and eminences to the North and East of the Alleghany range—have been much exposed to heat and cold and wet —not having had my clothes dry in some instances, for six days in succession—have been subjected to all the varieties of living, from that which is obtained at the first Hotels in the United States, down to salt pork and dry beans and pease cooked in the woods, and after all, my constitution was never more firm and vigorous, nor was I ever capable of enduring more fatigue, or greater exertion, than I am now at the age of 45. If then our literary men were to inquire of me what they must do to preserve and enjoy health, I should readily answer—Discard about 9-10ths of the rules laid down by

the *pedantic* writers and lecturers of the present day on that subject —walk at least, ten miles each day, at the rate of 4 miles per hour —about three or four times each year shoulder your knapsack, and with your Barometer, &c. ascend to the summits of our principal Mountains and determine the altitudes, walking from 30 to 70 miles per day, according as you can bear the fatigue; do all these, and I will ensure you firm and vigorous constitutions, and an entire freedom from those loads of *debility*, *Dyspepsia*, &c. under which so many of you are labouring and languishing out a miserable and useless existence; adhere to these rules, and study, however severe, will not injure you, on the contrary your mental vigour will keep pace with the improvement of your physicial energies.

The following altitudes were obtained during the preceding excursions.

Altitude of Saddle Mountain above tide water at Troy, N. Y. 2959
Do. of the same above the East College at Williamstown, Mass. 2236
Do. of Mt. Anthony above the meeting house in Bennington village, 1401
Do. of the height of land in Petersburgh, (west of Williamstown, Col.) above tide water at Troy, 1869
Do. of the same above the East Col. in Williamstown, 1223
Do. of the Grand Monadnock above the site of the court house at Keene, N. H. 1540
Do. of Mount Holyoke above Conn. River at S. Hadley ferry, 761
Do. of the site of Round Hill School above the same, 174
Do. of the Sugar Loaf* above Conn. River at Sunderland bridge, 174
Do. of King's Hill,† near Hatfield village above Conn. river. 103

A. PARTRIDGE.

*Sugar Loaf is a beautiful eminence about one mile from Bloody-Brook, and is celebrated in the early Indian Wars.

† King's Hill is a small but beautiful elevation near Hatfield village, celebrated on account of a sanguinary fight between the early settlers and their Indian neighbours.

NATURAL HISTORY.

BICEPHALOUS INFANT.

One of the most remarkable anomalies in the human shape was lately exhibited at the gardin des Plantes, at Paris, consisting of a bicephalous or two-headed infant, composed of the perfect forms of two female children, as far as the head, shoulders, and arms, which were incorporated into one body, and terminated by the lower limbs of a single individual. This production was the offspring of a poor Italian couple of the name of Parodi, and lived to the age of eight months in full health, and capable of distinguishing the voice of their parents. One of them was named Rita, and the other Cris-

tina. The two individuals, if they might be so styled, appeared to enjoy as much intelligence and sensibility as is common with children of their age, and to have a separate sensation and volition. Cristina was stronger and livelier than her sister; both of them slept and awoke together, or alternately, and one of them could laugh or weep, cough, sneeze, or take its nourishment, while the other enjoyed a sound sleep. When they were both asleep they could be alternately awakened by tickling the foot which corresponded to the respective parts of each other, and one could even be operated on so as to laugh with some violence without disturbing the repose of the other. This curious compound being seemed to be capable of existing a much longer time than it actually survived, and the cause of its death was attributed more to the want of due care and attention, which the poverty of its parents prevented them from bestowing on it, than from its peculiar formation. It was supposed that exposure to cold was the occasion of the malady which terminated their existence. The feebler one of the two, Rita, was attacked by the croup, while the other, Cristina, did not appear to be much affected by it. The disorder operated with violence and rapidity on Rita, and the fever attending it elevated her pulse to 120 beats in a minute, while those of Cristina were 102; and the latter appeared to be most distressed, by the necessity of keeping pace with the respiration of her sister. Rita sunk under the violence of the malady, and such seemed to be the mutual and inseparable dependence of each other's existence, that although Cristina's vigour would to all appearance have enabled her to overcome the disease, if she alone had had to support it, yet when Rita died Cristina expired almost at the same moment, as if the two bodies, capable of distinct action and will, had yet been actuated by one soul.

THE TEA PLANT.

The cultivation of tea is not general throughout the Chinese empire; the northern parts being too cold, and the southern parts too warm. The plant is the growth of a particular region, situated between the thirtieth and thirty-third degrees of north latitude, called the tea-country, *Tok-yen*, *Ho-ping*, *An-koy*, &c. There are some plantations near Canton, but they are few, and those that do exist are of no great extent. The trees are planted four or five feet asunder; they have a very stunted appearance; and they are not allowed to grow higher than is convenient for men, women, and chil-

dren, to pick the leaves. The gatherings take place from one to four times in each year, according to the age of the plant. It is only the difference in the times of gathering, and manner of curing, which causes the distinction in appearance, qualities and value; those which are gathered earliest in the spring, make the strongest and most valuable tea, such as pekoe, souchong, &c.; the inferior, such as congou, bohea, &c. are of the latest gatherings; green, or hyson, can be made of any of the gatherings, by a different mode of drying. The first gathering of the leaves begins about the middle of April, and continues to the end of May; the second lasts from midsummer to the end of July; the third takes place during the months of August and September. When the leaves are gathered, they are put into wide shallow baskets, placed on shelves in the air, or wind, or mild sunshine, from morning till noon; then on a flat cast-iron pan, over a charcoal stove, ten or twelve ounces of the leaves are thrown at a time, stirred quickly with a short hand-broom twice or thrice, and then brushed off again into the baskets, in which they are equally and carefully rubbed between men's hands to roll them; after which they are again put into the pan in larger quantities, over a slower fire, to be dried a second time. When fired enough, the tea is laid on tables, to be drawn or picked over, putting aside all the unsightly and imperfectly dried leaves, in order that the sample may be more even and marketable. To make singlo or hyson, the first two gatherings are chosen, and, as soon as picked from the trees, are put into the pan; next rolled and spread thin, to separate the leaves, which adhere to each other; again well dried, spread, sifted, picked, and fired two or three times more, (especially if it is damp weather,) before it is in a marketable state.

The Chinese drink their tea without either milk or sugar; they partake of it plentifully at their meals, and very frequently in the course of the day. One mode of using it, among the higher ranks, is formed by grating into the cup, balls made of the most valuable leaves, cemented together by some kind of tasteless gum.

Gardener's Magazine.

SUGAR FROM INDIAN CORN.

Sugar is a principle which is abundantly diffused through the vegetable kingdom, particularly in those which inhabit warm climates. Much of this quality is owing to cultivation; and many plants in a state of nature contain very minute quantities of it, but which yield

it abundantly when grown in a luxuriant soil and favourable climate. The beet, parsnip, carrot, &c., are familiar examples of the effect produced by culture, from all of which sugar may be obtained in large quantities. The cane, which produces it in greatest abundance, is a grass which has for a long time been under cultivation, and no doubt owes to this process the development of much of its saccharine properties. Indian corn, or maize, is a grass similar in its growth and form to the sugar cane, but its juice is watery and insipid as it grows in our climate. In the warmer parts of South America, however, where its stem attains a very great size, the juice contains so much of the saccharine principle as to render it probable that it might be cultivated to advantage for the purpose of obtaining sugar from it. Cortez, in a letter to Charles V., states, among other productions of the Mexicans, that they made of the juice from the stem of the maize a syrup as pleasant as that of the sugar cane. It has been supposed that this statement was erroneous, and that Cortez had been mistaken as to the plant which furnished this syrup. From experiments which have been made on the stalks of Indian corn growing in the warm regions of Maraquita, by Mons. Roulin, a French physician, it has been found that sugar may be obtained from them in considerable quantities, while the same plant, from districts farther north, were found nearly destitute of any saccharine matter.

LATE FLOWERING OF PLANTS.

The past season has been remarkably favourable to vegetation in all parts of the country. Many kinds of fruit trees have borne second crops, and some of the esculent vegetables have furnished our tables with a second taste of the products of spring. The influence of our mild autumn appears to have had the same effect upon the growth of our native plants. In some situations, where they have been sheltered by a thick growth of evergreens, we have noticed a second flowering among some of them, or rather, perhaps, their flowering season has been prolonged beyond its usual term. In the maritime counties of New-Jersey, where large districts of sandy soil are covered with pine-trees, and the underwoood consists almost entirely of bushes of Kalmia, Prinos, Comptonia, and others, interspersed with the creeping Gualtheria, and Epigœa, which maintain a perpetual verdure, and give the appearance of continued summer to these barrens, as they are called, we noticed the narrow-leaved *Kalmia* still bearing its beautiful blossom. Along the

sides of ditches, and the margins of streams, the Witch-Hazle *hamamelis virginica* was, in its natural season, (November,) in full flower, and is remarkable for losing its leaves, like other deciduous trees, in the fall, and putting forth its flowers when every thing else bears the aspect of winter. In these situations, closely pressed to the earth, over which it spreads in large patches, we noticed the *Diapensia*, with its small, delicate, evergreen leaves, and covered with its beautiful flowers, in full bloom, and in as full luxuriance, as if it still enjoyed the full summer, although its flowering season is now protracted three months beyond its usual period.

THE CHETAH, OR HUNTING LEOPARD.

Uniting to the system of dentition, the general habits and many of the most striking peculiarities of the cats, some of the distinguishing features and much of the intelligence, the teachableness, and the fidelity of the dog, the Hunting Leopard forms a sort of connecting link between two groups of animals, otherwise completely separated, and exhibiting scarcely any other character in common with the carnivorous propensities by which both are, in a greater or less degree, actuated and inspired. Intermediate in size and shape between the leopard and the hound, he is slenderer in his body, more elevated on his legs, and less flattened on the fore part of his head than the former, while he is deficient in the peculiarly graceful and lengthened from, both of head and body, which characterize the latter. His tail is entirely that of a cat ; and his limbs, although more elongated than in any other species of that group, seem better fitted for strong muscular exertion than for active and long-continued speed.

In the number and form of his teeth, in the asperity of his tongue, in the conformation of his organs of sense, and in the number of his claws, he accurately corresponds with the legitimate species of the genus Felis. The principal character in which he differs from them consists in the slight degree of retractility of these latter organs. Instead of being withdrawn within sheaths appropriated for the purpose, as in the whole of the cats properly so called, the claws of the Hunting Leopard are capable of only a very limited

retraction within the skin, and are consequently exposed to the action of the ground on which they tread, their points and edges being thus rendered liable to be blunted by the constant pressure to which they are subjected, almost to the same extent as in the dogs. The slightest consideration of the uses to which the claws are applied by the whole of the feline tribe, in whom they are, in fact, in consequence of their extreme power and sharpness, organs of offence if possible more deadly and more destructive than the teeth, will teach us that the modification which has just been described in so important a part of their organization, must of necessity be accompanied by a corresponding change in manners and habits; and that convenience alone, and the want of analogous structure in any other animal could justify us in continuing to class the Chetah among the cats, from whom he differs in so essential a particular.

In outward form, however, notwithstanding his more slender make, the difference between them is by no means great. His head, although more elevated and prominent in front, exhibits the same broad lateral expansion, caused by the thick mass of muscle which acts so powerfully upon the short and dilated jaws of the cats, and imparts to them that tremendous force and effect for which they are so remarkable. His legs, notwithstanding their increased length and slender proportions, retain all the elatic springiness, by means of which the Leopard or the Tiger are enabled to bound with so much vigour and velocity upon their unsuspecting prey. His air and manners, too are unquestionably those of the cats; and his mode of colouring, which we shall next proceed to describe, although exhibiting very peculiar and marked distinctions, offers so close an analogy to that of the Jaguar and the Leopard, that, were we to regard this character alone, it would be impossible to arrange him in a different group from that which comprehends those beautifully spotted,but ferocious, beasts. His fur, however, it must be remarked, has little of the sleekness which characterizes those animals, but exhibits, on the contrary, a peculiar crispness which is not to be found in any other of the tribe.

His ground-colour is a bright yellowish fawn above, and nearly pure white beneath, covered above and on the sides by innumerable closely approximating spots, from half an inch to an inch in diameter, which are intensely black, and do not, as in the Leopard and others

of the spotted cats, form roses with a lighter centre, but are full and complete. These spots, which are wanting on the chest and under part of the body, are larger on the back than on the head, sides, and limbs, where they are more closely set: they are also spread along the tail, forming on the greater part of its extent interrupted rings, which, however, become continuous as they approach its extremity, the three or four last rings surrounding it completely. The tip of the tail is white, as is also the whole of its under surface, with the exception of the rings just mentioned; it is equally covered with long hair throughout its entire length, which is more than half that of the body. The outside of the ears, which are short and rounded is marked by a broad black spot at the base, the tip, as also the inside, being whitish. The upper part of his head is of a deeper tinge; and he has a strongly marked flexuous black line, of about half an inch in breadth, extending from the inner angle of the eye to the angle of the mouth. The extremity of the nose is black, like that of the dog. The mane, from which he derives his scientific name, is not very remarkable: it consists of a series of longer, crisper, and more upright hairs, which extend along the back of the neck and the anterior portion of the spine.

Such are the outward and physical characteristics of this beautiful animal; in his moral and intellectual qualities he differs still more widely from that compound of unteachableness, malice, and mistrust, which is the necessary result of the low degree of intelligence possessed by the remainder of the group of animals with which he is at present associated. Of his habits in a state of nature we have no certain information; but in his tamed and domesticated condition he has been rendered, in some countries at least, auxiliary to man, by the successful cultivation of his mental faculties, which have been trained into a degree of subservience to the commands of his master, that can only be surpassed by the superior sagacity of the hound. Chardin, Bernier, Tavernier, and others of the older travellers had related that in several parts of Asia it was customary to make use of a large spotted cat in the pursuit of game, and that this animal was called Youze in Persia, and Chetah in India; but the statements of these writers were so imperfect, and the descriptions given by them so incomplete, that it was next to impossible to recognise the particular species intended. We now

however, know with certainty that the animal thus employed is the Felis jubata of naturalists, which inhabits the greater part both of Asia and of Africa. It is common in India and Sumatra, as well as in Persia; and is well known both in Senegal and at the Cape of Good Hope; but the ingenuity of the savage natives of the latter countries has not, so far as we know, been exerted in rendering its services available in the chase in the manner so successfully practised by the more refined and civilized inhabitants of Persia and of Hindostan. In Senegal it is valued only on account of its skin, which forms an important article in the commerce of that colony; while at the Cape, where it is known to the Dutch settlers by the misapplied name of Luipard (Leopard,) it seems to be entirely neglected even in a commercial point of view. In the neighbourhood of the latter colony, it should be added, the animal appears from the testimony of travellers to be of rare occurrence; and Professor Lichtenstein, in particular, mentions an instance in which the skin of one was worn by the chief of a horde of Caffres as a badge of peculiar dignity and distinction.

But even in the East, where the qualities of the Chetah appear to be best appreciated, and his faculties to be turned to most account, it would seem that he is not employed in hunting by all classes of the people indiscriminately; but, on the contrary, that he is reserved for the especial amusement and gratification of the nobles and princes of the land, rather than used for purposes of real and general advantage. In this respect, and indeed in many others, as will be seen by the following brief account of the mode in which the chase with the Hunting Leopard is conducted, it bears a close resemblance to the ancient sport of hawking, so prevalent throughout Europe in the days of feudal tyranny, but scarcely practised at the present day except by the more splendid slaves of Asiatic despotism. The animal or animals, for occasionally several of them are employed at the same time, are carried to the field in low chariots, on which they are kept chained and hooded, in order to deprive them of the power and temptation to anticipate the word of command by leaping forth before the appointed time. When they are thus brought within view of a herd of antelopes, which generally consists of five or six females and a male, they are unchained and their hoods are removed, their keepers directing their attention to the prey, which, as they do not hunt by smell, it is necessary that they should have con-

stantly in sight. When this is done, the wily animal does not at once start forwards towards the object of his pursuit, but, seemingly aware that he would have no chance of overtaking an antelope in the fleetness of the race, in which the latter is beyond measure his superior, winds cautiously along the ground, concealing himself as much as possible from sight, and, when he has in this covert manner nearly reached the unsuspecting herd, breaks forth upon them unawares, and after five or six tremendous bounds, which he executes with almost incredible velocity, darts at once upon his terrified victim, strangles him in an instant, and takes his fill of blood. In the meanwhile the keeper quietly approaches the scene of slaughter, caresses the successful animal, and throws to him pieces of meat to amuse him and keep him quiet while he blinds him with the hood and replaces him upon the chariot, to which he is again attached by his chain. But if, as is not unfrequently the case, the herd should have taken the alarm, and the Chetah should prove unsuccessful in his attack, he never attempts to pursue them, but returns to his master with a mortified and dejected air, to be again let slip at a fresh quarry whenever a fit opportunity occurs.

The Chetah has been until of late years very imperfectly known in Europe. Linnæus was entirely unacquainted with it, and Buffon described it from the fur alone under the name of Guepard, the appellation by which its skin was distinguished in the commerce with Senegal, but evidently without suspecting its identity with the Asiatic animal, the trained habits of which, misled probably by the authority of Tavernier, he erroneously attributed to his imaginary Ounce. Subsequent French zoologists had rectified this error, and it was generally believed that the tamed Leopard of Bernier, the Youze, the Guepard, and Tavernier's Ounce, were one and the same animal; but it was not until a year or two ago that the possession of a living specimen, brought from Senegal, in the Menagerie of the Jardin du Roi, enabled M. F. Cuvier to ascertain its characters with precision. The comparison of this African specimen with the skins sent from India, and with the notes and drawings made in that country by M. Duvaucel, to whom we are indebted for a vast deal of interesting information relative to the zoology of the East of Asia, at once put an end to all doubts of the identity of the two animals.

Tower Menageri.

NATURAL PHILOSOPHY.

MATTER AND ITS PROPERTIES.

[Continued from page 268.]

That tendency which all bodies have to approach, or to remain in contact with each other, is called *attraction*, of which there are several kinds, namely: attraction of *gravitation*, attraction of *cohesion*, *capillary* attraction, *electrical* attraction, *magnetic* attraction, and *chemical* attraction.

He who throws a stone, or shoots an arrow into the air, perceives that the force with which it was impelled is soon exhausted, and that it then falls to the ground with a force proportioned to its weight, and the height to which it was thrown. It is easy to suppose that the progress of the stone might be impelled, and even stopped by the resistance with which it would meet from the air, but why should it return again to the earth, and that too with a rapidly accelerating velocity? If we are told that it falls because it has weight, and is a heavy body, we might again ask, what is weight, and what makes a body heavy? The only philosophical answer to this question must be, *weight* is that power which the earth exerts upon all matter, drawing it towards its own centre, and this power is known by the name of *attraction of gravitation*. The force of this attraction is in exact proportion to the quantity of matter in the body attracted; for as every particle of matter is attracted by the earth, so the greater number of particles there are, the greater will be the attraction, gravity, or weight,—each of these terms, meaning nearly the same thing. It happens, however, that some bodies are attracted with greater force than others of greater bulk, a bullet of lead, for instance, is heavier than one of the same size of cork; and one of gold is still heavier than that of lead; this however, is no variation of the law just stated, for cork being porous, contains fewer particles of matter than the lead, and the lead being also less compact, contains fewer particles in the same space, than the gold; this is also what is meant by *specific gravity*.

To the profound and immortal Newton we are indebted for nearly all the knowledge we possess of the laws of gravitation, or of falling bodies. The simple incident that drew his attention to the subject, is related by his friend, Dr. Pemberton. "About the year 1665, or the 24th of his age, Newton retired from Cambridge into the country, in order to avoid the plague which then raged with great violence; and sitting one day in an orchard, an apple falling from one of the trees, gave a new turn to his reflection. The phenomena of falling bodies engaged his attention, and pursuing the ideas which presented themselves to his mind, he carried his reseaarches from the earth to the heavens, and began to investigate the nature of motion in general. Since there is motion he observed, there must be a force which produces it, but what is that force? That a body, when left to itself, will fall to the ground, is known to the most illiterate, but if you ask the reason of its doing so, they will think you a fool or a madman; the circumstance is too common to excite their admiration, although philosophers are so much embarrassed with it that they find it almost inexplicable. In like manner, when a stone, or other body is placed upon a table, it presses the table with the same force by which it would, if left to itself fall to the ground. And when a body is suspended at the end of a string, the force with which it pushes downwards stretches the string, and if this be not sufficiently strong, breaks it. From which circumstance, it appears that all bodies press with a certain force upon those which support and hinder them from falling; and that the degreee of force in either case, is precisely the same with that, which in a free space, would bring them to to the ground." The discovery of the laws of gravitation, was one of the most important wants in the history of science, and has justly elevated the name of this illustrious discoverer above that of all other men.

Many theories have been formed to account for gravitation; but the cause of it is wholly unknown, and is likely to remain among the hidden operations of nature.

The attraction which exists between those particles of matter which are in contact with each other, is termed the *attraction of cohesion*, which is observable in almost every object of nature. Upon the degree of this attraction, or as it is commonly called, the *cohesive power*, depends the strength of all materials used in building, the arts, &c. Generally speaking, the cohesive power of

metals is much greater than that of vegetable or animal matter. The following are the results of a course of experiments made to try the strength of the different substances mentioned—the figures opposite the material represent the number of pounds a piece *one tenth* of an inch in diameter will sustain; they are the following:

Raw Flax	37 lbs.	Zinc	18 lbs.
Horse Hair	45 "	Lead	29½ "
Raw Hemp	46 "	Copper	299 "
Raw Silk	53½ "	Brass	360 "
Elm Wood	35 "	Silver	370 "
Oak "	48 "	Iron	450 "
Beach "	50 "	Gold	500 "
Ash "	50 "		

The roundness of drops of water, quicksilver, &c., also depends upon this kind of attraction, each particle attracting all the others with equal force, and being attracted equally by all of them in turn, they altogether naturally assume a globular shape. For the same reason, two drops of water, quicksilver, &c. will unite when brought in contact with each other, and form but one.

Of *capillary attraction* we have already treated in a former number, and shall therefore, only refer the reader to the remarks which are there made on the subject.*

If a person take a piece of amber, sealing-wax, varnish, glass, &c. and rub it smartly with a piece of silk, or wollen cloth, it will attract feathers, and other light articles that come near to it—so if a sheet of paper be laid on a varnished table, and rubbed with a piece of India-rubber, it will be strongly attracted to the table: now, as we know that electricity, is excited or developed by these processes, the attraction which is thus produced is called *electrical attraction*, or *attraction of electricity*. Accompanying this *attraction* there is also an electrical *repulsion*, both of which properties may be exhibited by some very curious and amusing experiments: we must, however, omit these till we come to treat upon the subject of Electricity, which we shall take occasion to do more at large hereafter.

Of *magnetic attraction*, every one of our readers must be more or less acquainted. Few events have transpired since the world be-

* See No. 5, 224

gan, of more importance to civilized man than the discovery of magnetic attraction, and the application of it to the purpose of guiding the mariner on the pathless deep, amid storms, and tempests, and clouds and darkness. Before the polarity of the magnetic needle was known, or more properly speaking, before the needle itself was discovered, the cautious mariner was obliged to creep along the coast, following the indentations of the sea, feeling his way from cape to cape, and hastening to secure his barge in the mouth of some small rivulet, or bay, upon the least appearance of a storm, or upon encountering adverse winds. "The modern navigator boldly seeks the ocean, and when the night and the storm close around him, his path is marked out, wonderfully indeed, but easily and unerringly. The shore was the safety of the ancient, it has become the dread of the modern mariner. No Palinuris, like him of old, now stands at the helm to watch the stars, and when they are shrouded from his view, to confess his ignorance and despair. A better star than Orion, or Arcturus, now shines upon those who go down to the great deep in ships." By means of this law, whose operations are hidden in the dark and unfathomable recesses of nature, new islands, new nations, and a new continent have been brought to the knowledge of civilized man, and the distant and scattered portions of the human family have been made acquainted with each other, and connected together by "the golden chain of commerce."

It only remains for us to notice the fifth species of *attraction*, which is that of *chemical attraction*, or *affinity*. It is called chemical attraction because it is by that means that all chemical analyses are made: it is that power by which the particles of matter are united so intimately as to form a body inseparable by any mechanical power. This may be exemplified by the instance of *water*, which is a compound of two gazes, chemically united, and which no mechanical power in the world can separate—so of any two substances having an affinity or attraction for each other, are placed in contact, they combine and form another substance, sometimes differing from either, such for instance as muriatic acid and soda, which have a strong chemical attraction, and when combined by means of this power, form the well-known article muriate of soda, or common salt. These, though easily dissolved by other chemical affinities, effectually resist all efforts of *mechanical* power.

The operations of this curious law of matter, afford an almost infinite variety of experiments, both useful and amusing to the philosophical student. We will give one or two examples. To a little of the solution of sulphate of iron, a colourless fluid, add a few drops of prussiate of potash, also a colourless fluid, and the whole will immediately assume a beautiful blue colour. In this experiment, the sulphuric acid of the first ingredient having a stronger chemical attraction for the potash than for the iron, and the prussic acid, on the contrary, having a stronger affinity for the iron than for the potash, both leave the substances they were previously united to, and form prussiate of iron and sulphate of potash; the sulphate of potash remaining in solution, while the prussiate of iron is precipitated, and forms a fine blue powder, which is known by the name of prussian blue.

Put into a glass a quantity of water, to which add a little of the solution of nut-galls; to this colourless fluid add a small quantity of the solution of sulphate of iron, which is also colourless, and the whole will immediately become a fine black ink. In this, as in the former experiment, a decomposition and a reunion of the compound articles takes place by means of the power of chemical attraction. Thus nature, by the force of this law, is constantly carrying on that organization, dissolution, and re-organization of matter which we every where perceive, which forms that almost infinite variety of shape and costume in which she delights to exhibit herself, and which is productive of the most salutary and pleasing effects. He who has made her operations the subject of his thoughts, has not failed to perceive that there is nothing permanent, nothing lasting; that the hardest substances known, are liable to dissolution, and that no monument, however massive,—even "the everlasting hills" can resist the slow, but ceaseless operation of *chemical attraction.*

AGRICULTURE.

CULTIVATION OF THE CRANBERRY.

The numerous tracts of marshy and swampy ground which lie all along our sea-coast, and the margins of our rivers, are usually suffered to remain entirely useless to the proprietors, and as not worth the cost of reclaiming them. There are means, however, of employing this sort of waste lands, which would render them as profitable as any kind of soil. The cranberry of our country, which forms so large a subject of home consumption and exportation, and which far exceeds in size and the rich tartness of its flavour, the European fruit of that name, is peculiarly adapted to this kind of marshy ground, and, if cultivated, would yield in the greatest abundance. An experiment made with the greatest success, has recently been published in the Barnstable (Mass.) Journal. Capt. Hall, of that place, the owner of a sandy bog of land, entirely unfit for the growth of any thing but rushes and swamp brush, planted several acres with cranberries, and the crop which he obtained amply repaid him for the labour and capital he employed in this manner. An idea may be formed of the profitable nature of this sort of husbandry, when it is stated that above seventy bushels were obtained from one acre, which were sold at the market price of $1 to $1 50 per bushel. The vines, he observes, grow best where the soil is most sandy and damp, and the crop is as certain, with very little management, as any grain or garden vegetable. They are transplanted generally in the fall, and the manner in which this is done is simple. Holes are dug four feet apart, and rather deeper than is proper for corn: into these holes the sods containing the vines are placed. The cranberry has very creeping roots, and in three years will spread so as entirely to cover the ground. The brush only requires to be removed, the roots of the vines being soon able to destroy all the other kinds of weeds. No other care is required than to keep the cattle from injuring the vines.

PROFITABLE COW.

One fact is worth a thousand theories. At the exhibition of cattle recently held at Hartford, Con., a premium was awarded to Dr. Samuel B. Woodward, of Wethersfield, for two cows which he exhibited, and which yielded, during the months of May, June, July,

August, September, and October, five hundred and seventy-six pounds of Butter! To these two cows, another was added on the first of September, which, with the butter made from the first two, during the first week in April, increased the amount to 597 pounds 9 ounces!!

Besides all this, says the Doctor, milk and cream have been sold to the amount of $3, and a family of sixteen persons furnished with milk and cream, worth at least $1 a week, at four cents a quart, and pork fed to the amount of at least $15.

The proceeds of these cows he reckons as follows:—Butter $100; Milk, &c. sold, $3; Milk used in the family, $26; Pork, $15. To this add $15 75, the price for which the calves sold in the spring—Total, $159 75.

The cows were fed on grass only, after the middle of May, before which they had what is called rowen hay, with two quarts of meal a day. One of the cows is half Devonshire blood, the other the common kind; one is five, and the other six years old.

SMALL FARMS.

Those farms which now, under a careless system of culture, barely afford sustenance for a single family, might be made to support three or four—and that too with much less toil and trouble, in proportion to the quantity cultivated. Many of our farmers grasp at the management of too spacious a territory—the consequence is, they impose upon themselves a state of slavery: they accumulate nothing, except now and then an additional patch of land, which serves only to increase their burdens without augmenting their income. Were they, on the contrary, to confine their exertions to smaller spots, while their crops could be rendered equally if not more abundant, they would themselves enjoy life better; become more independent, and, with a better share of frugality, more wealthy; they would acquire time to institute experiments, and to examine improvements; they would attain what they scarcely now ever possess, *leisure;* by which we mean not the privilege of being lazy but that sort of leisure which poor Richard describes as a time for doing something useful—time for study, for reflection, for familiar converse, for looking after the education of their young—in short, for realizing the blessings after which they are constantly toiling.

N. E. Farmer.

USEFUL ARTS.

FRICTION OF SCREWS AND SCREW PRESSES.

An examination of the friction in screws having their threads of various forms, has developed the fact that the friction of screws with square threads, is to that of the same sized screw of triangular threads, as 2.90 to 4.78, proving that the former possesses important advantages over the latter, in the relative loss of power by friction.

NEW DRAWING PEN.

A very ingenious pen has been constructed for the purpose of drawing, which is said to answer a most admirable purpose, and what is by no means the least part of its excellence, the materials for constructing one are always at hand, and the manner of putting them together so simple, that whoever has occasion to use one can make it for him or herself. The following description of this little instrument is from the Register of Arts:

"Upon the blind end of a black-lead pencil was stuck a piece of sealing-wax, by melting it, of the size of a goodly marrowfat pea, forming therewith a bulb; then was stolen from a lady's needle-case three needles, and having successively warmed their eyes in the flame of a candle, they were buried under the wax at equal distances apart, around the circumference of the pencil, with their points extending about three quarters of an inch beyond the end of it, and brought together so as to meet as accurately as possible at a focus. In this position the needles formed the outline of a triangular pyramid, and they were thus secured by placing midway between the aforesaid bulb of wax and the points, another piece of wax of the size of a grain of rice, and carefully melting the same. The very acute points of the needles were next taken off by light rolling touches upon an oil-stone, and the raggedness by a little fine emery paper, so as to produce an obtuse conical end, that is to say, such a point as would bother a person, if in a hurry, to pierce diametrically through the centre of a fine hair. The pen was thus completed, and found capable of *drawing exceedingly fine, clear, smooth, uniform lines, in every direction*, with equal facility, and entirely free from scratch or splutter."

With a pen of this kind, which costs only about a penny, lines

may be drawn so exquisitely fine, that two of them drawn close together will appear as one line, until examined by a magnifying glass, when they will be found to be distinct and perfect lines. The chief excellence of these pens, however, consists in their making straight and curved lines with equal freedom and smoothness in every direction: this is far from being the case with an ordinary drawing pen, which young draftsmen find exceedingly troublesome and difficult to manage. Instead of being driven half mad with ragged, squatchy, spluttering lines, they may with this pen draw away with all their might, with the same ease as with a black-lead pencil, and make only such lines as a limner would adopt for the eye-lashes of a flea.

REFINED OX-GALL.

THE refined ox-gall possesses all the valuable properties of ox-gall, as applicable to painting in water-colour, with the superior advantages of being deprived of all tendency to putridity, and of all colouring matters.

It combines with, and fixes all water-colours, as they are usually prepared; either by being mixed with them, or washed over them after they are laid upon the paper, &c. It renders blue, purple, red, green, and all other delicate colours, more bright and durable; and if a small portion of it be added to any of the colours, it causes them to wash more freely and evenly over the surface of the paper, ivory, &c.

Combined with gum-arabic, it gives depth of tint, without any unpleasant glossiness upon the surface of the drawing, prevents the gum from cracking, and the colours are so completely fixed in the paper itself, that subsequent tints can be washed over them, without any risk of their becoming foul, or forming improper combinations with the under colours.

Combined with fine lamp black and gum-water, it forms a complete substitute for Indian ink.

If it be floated over the surface of drawings made with chalk, or black-lead pencil, it fixes them firmly; and they may then be washed over with any water colours, previously mixed with a small portion of it; without, in the least degree, disturbing the chalks or black-lead.

From miniature-painting, being washed over the surface of the ivory, it completely removes all greasiness; and being mixed with the

colours, it causes them to float thereon; and tints may be laid over tints. the colours being struck into the ivory.

For transparencies, oiled paper being first washed over with the refined ox-gall, and permitted to dry, water-colours, mixed with some of it, will be freely and perfectly smooth upon it; and be so fixed, as not to wash up by the repetition of different glazing of colours over each other, thus producing depth of colour.

In short, the valuable properties this refined ox-gall possesses, make it equally applicable to historical, landscape, botanical, and natural history painting, as well as to colouring prints in general; and by its readily combining with all the vehicles used in the preparation of water-colours, and having no colour itself, it enables the artist to paint with ease, on surfaces, otherwise unfavourable; at the same time rendering the colour more bright and durable.

Many other valuable properties will no doubt, on trial, be found in this preparation; and the result cannot fail to facilitate and improve the art of painting in water-colours: and, as the discovery of it is entirely new, it will in all probability, be found applicable to many other useful purposes.

Process for depriving ox-gall of its tendency to putridity, and of its Colouring-Matter, so detrimental to all delicate Colours.—To a pint of fresh ox-gall boiled and skimmed, put one ounce of alum, finely powdered; continue it on the fire until combined: when cold, put it into a bottle, and cork it moderately close.

To another pint of fresh ox-gall, also boiled and skimmed, put one ounce of common salt, and continue it on the fire until combined; when cold put it into another bottle, and cork it moderately close.

Gall, thus prepared, will keep perfectly free from putridity, or any offensive smell for years.

When the above preparations have stood in a room of moderate temperature, for about three months, they will deposit a thick sediment, crusts will form on their surface, they will become clear, and be fit for use in ordinary purposes; but as they contain a large proportion of yellow colouring matter, tinging blue of a greenish hue, reds brown, and sullying purples; they are unfit for general use, in painting in water-colours.

Further process.—The before-mentioned preparations, after standing until they are become perfectly clear, are to be decanted, and combined in equal proportions; a thick coagulum is instantly formed, of the yellow colouring matter, which precipitates, leaving a clear liquid, namely, the colourless ox-gall.

N. B. After the combination of the two first preparations, the

process may be assisted by filtering the liquid through a paper. Age renders this preparation more brilliantly clear; and from it, it seems to obtain an agreeable scent: nor has it been observed to contract at any time an unpleasant smell, or to lose its useful properties.

Register of Arts.

To preserve Steel from Rust.—Take some melted virgin wax, and rub it over the article to be preserved. When dry, warm the article again, so as to get off the wax, and rub with a dry cloth until the former polish is restored. By this means all the pores of the metal are filled up, without injury to the appearance, and rust will not attack it unless it is very carelessly exposed to constant humidity.—*Journal des Connaissances Usuelles.*

Adulterated Bread.—At the last sitting of the Academy of Medicine in Paris, a memoir was read on the adulteration of bakers' bread in the French capital; from which it appears, that the sulphates of copper and zinc are employed by many of the bakers' to such an extent as to render the bread highly unwholesome.

Seltzer Water.—A very economical mode of making Seltzer was ter is practised at Geneva. The carbonic acid gas being first obtained from lime, and afterward purified, this water is then forced into a large cask of water, in which is a wheel, that agitates it, and causes the gas to mix equally with the fluid. The water, thus saturated, is then put into bottles, which are corked in the usual way of Seltzer water, and sold during the hot weather in the streets at about a halfpenny per bottle.

PORTABLE GLUE FOR ARCHITECTS, DRAFTSMEN, &c.

Take 1 lb best glue, boil and strain it very clear, boil also 4 oz of isinglass, put the mixture into a double glue pot, add 1-2 lb brown sugar, and boil the whole till it gets thick, then pour it out into thin plates or moulds; when cold you may cut and dry them in small pieces for the pocket. This portable glue is used by simply holding it over steam or moistening it with the mouth.

NEW LIGHT.

A combination of liquids for the production of light has lately been invented by Mr. ISAIAH JENNINGS, of this city, which is said to be much preferable to oil, and which can be used as a substitute for it. It is also said to be much cheaper, one gallon of it affording as much light as a gallon of oil, and costing only about two-thirds as much. It can be burnt either with cotton or metal wicks, or without any wick at all. The flame which it produces, though not as brilliant as that of gas, is entirely free from smoke, and the offensive odour which is inseparable from oil.

LEATHER CLOTH BOOTS AND SHOES.

A process has been invented, in England, for rendering cloth and other fibrous substances glossy, resembling leather, and impervious to water. The composition consists of one pound of bees-wax, eight ounces of India-rubber, four ounces of resin, eight ounces of ivory-black, and four ounces of lamp-black, melted together by the application of a continued slow heat, or by boiling, and brought to a consistence which can be applied with a brush, similar to that used in applying varnishes to different substances. The fabric is then stretched on the top of a vessel, and heated by water, in order to preserve a uniform temperature, while the composition is being spread upon it. After the first coat has been dried by exposure in the open air, a second coat is to be applied, in a similar manner; and for some purposes a coat of caoutchouc varnish is to be applied on the inside of the fabric to render it perfectly impervious to moisture.

IMPROVED PREPARATION OF CANDLES.

Steep the cotton wick in lime-water, in which is dissolved a considerable quantity of nitrate of potash. By this means is obtained a purer flame, and a superior light—a more perfect combustion is ensured; snuffing is rendered nearly superfluous, and the candles thus treated, do not run. The wicks should be thoroughly dry before the tallow is put on them.—*Phil. Jour.*

MECHANIC ARTS IN CHINA.

"The perfection of the mechanic arts in China cannot be denied in certain instances; but this is evidently not the result of a regular combination of scientific improvements. It appears to be the effect of the laboured experience of ages, brought slowly and difficultly to a certain point, where it is stationary, and cannot advance further, until science shall dispel the prejudices of habit and the clouds of ignorance. There is certainly a superiority in several of their silk manufatures, as it regards the gloss and the fixing of the colours, and the rendering them so bright and permanent; but this is not produced by any secret mordant or process unknown to Europeans. I was once present at the dyeing of silks; and, on examination, found the process conducted in the simplest manner, with the commonest mordants used in England. They know very little of the chemical agents, the use of which has become so common in Europe; and the brightness and permanency of their colours must be derived from a very nice experience of the application of the mordants, the climate, and other favourable, and concurring circumstances. Owing to the cheapness of labour, a very large number of hands are employed; therefore the work goes on with a rapidity almost beyond conception, and the silks are immediately hung out to dry during the prevalence of the north wind, called by them *Pak Fung*. Certainly, in any other climate, and under different management, more time would be required, and that circumstance would suffice to alter very much the appearance of the colours. The Chinese never attempt to dye any fine silks with rich colours until the Pak Fung commences, which generally happens towards the last of September, or the beginning of October. This wind is so remarkable in its effects, and so immediately felt, that should it begin at night, even when all the doors and windows are shut, the extreme dryness of the air penetrates into the house immediately, and the furniture and floors begin to crack, with a noise almost as loud as the report of a pistol. If the floors have been laid down in summer, when the air is damp, or if the planks be not exceedingly well seasoned, and secured with iron cramps, they will open an inch at least when the north-east monsoon commences. The Chinese will not even pack teas or silks for exportation in damp weather; that is to say, unless they are hurried to do it by the strangers who have

business with them, and wish to get their ships away sooner than ordinary. I have known a ship detained three weeks longer than the captain wished at Canton, because the security-merchant would not pack the silks which formed part of her cargo, until the weather became favourable. This will account in some measure, not only for the permanency and beauty of the dye, but likewise for the care that is taken to preserve it. The Chinese say that if newly-dyed silks be packed before they are perfectly dry, or in damp weather they will not only lose the brightness of the colour, but will also become spotted. They may have some secret in the spinning and tissue of silks, which we know nothing of; but certainly not in dyeing them. * *

Reg. of Arts.

ATTAR OF ROSES.

Ghaseepou is celebrated throughout india for the beauty and extent of its rose gardens; the rose fields occupy many hundred acres—the roses are cultivated for distilleries, and for making attar. The price of a seive, or two lbs. weight, (a large quart) of the best rose-water, is eight linas, or about 22 cents. The attar is obtained after the rose-water is made, by setting it out during the night, until sun-rise, in large open vessels exposed to the air, and then skimming off the essential oil, which floats on the top. To produce one rupeee's weight of attar, 200,000 well-grown roses are required. The juice even on the spot, is extravagantly dear, a rupee's weight being sold at the bazaar (where it is often adulterated with sandal wood oil) for £8, and at the English warehouses for £10, sterling. The cost of making the above quantity is said to be £5, sterling, including rent of land, cost of utensils, &c.—*Bishop Heber's Nar.*

MISCELLANY.

USEFUL ASSOCIATION.

A society is proposed to be formed in Paris, under the title of "Society of Domestic and Manufacturing Economy," with a view to encourage experiments, to collect facts and proceedings relating to domestic economy and the mechanical arts, and to publish them in a Journal. The price of the subscription is to be 25 francs a year, and every one of the subscribers will receive the Journal, to appear every three months, without any farther expense. Persons of both sexes are invited to contribute the aid of their talents and purses. *Bulletin Univ.*

THE HUMAN EYE.

If there is any one organ of the human system which more than another exemplifies the wonderful perfection of the works of the Divine Architect, it is that of the eye: this is truly one of the nicest and most perfect pieces mechanism which the human understanding can contemplate: a full and thorough acquaintance with its functions cannot well be obtained however, without a knowledge of the science of optics, but sufficient may be known without this knowledge, to enable us to admire the structure of this not less curious than useful organ. We shall endeavour to give our readers some general idea of its formation and the manner in which the shape of objects are perceived, or rather how the rays of light are conveyed through the eye, so as to produce that sensation which we call seeing.

The eye is of a globular form, and is composed principally of three *coats*, and three *humours*. The *coats* are, the *sclerotica*, *choroides*, and the *retina*, which support each other, and are arranged one over the other in concentric layers, like the coats of an onion. The *sclerotica*, or the outer coat, is white and opaque, and is joined to the *cornea*, which is that clear transparent membrane in front of the eye. Next to this is the *choroides*, so called on account of its being furnished with a great number of vessels: it

serves as a kind of lining for the outward coat. The *retina* is a fine web-like membrane covering the back part of the eye, and upon which the images of the objects are thrown by the refraction of the rays as they pass through the eye. From the centre of the retina proceeds the *optic nerve* which is supposed to be the medium of communication between it and the brain. The *iris* is an opaque membrane like the sclerotica; it is of different colours in different persons, being black in some, and blue, grey, hazel, &c., in others; this determines the colour of the eye. It has two sets of muscular fibres, the one of a circular form arranged around the hole in the middle, called the pupil, the other radiating from this to the circumference or outer edge of the iris: the object of these muscular fibres is to regulate the admission of light; when the light is too strong, the former contract and lessen the pupil, so that fewer rays can pass in; but when the light on the contrary, is weak, the pupil is enlarged by the action of the latter, for the purpose of admitting more of it. The operation of light in causing the pupil to dilate and contract, may easily be perceived by examining the eyes of a cat in the evening, by means of a candle; when the candle is brought near the eyes, the pupil will appear very small, but as the light is diminished, by removing the candle to a distance, it will gradually enlarge, till it will cover nearly the whole of the iris.

All the *humours* of the eye are perfectly transparent, and their purpose is to converge the rays of light that fall upon the *cornea*, to a point that they may pass through the pupil and reach the retina.

The *aqueous* humour lies in the fore part of the eye immediately behind the prominent cornea; it derives its name from its being of a watery consistence. Next to this is the *crystalline* humour which is shaped like a double convex lens, but is more convex on the back, than on the fore part: it is as clear and transparent as crystal, and of the consistence of a hard jelly; it converges the rays which pass through it and enter the *vitreous* humour which is in the rear and next to it. The vitreous humour like the others, receives its name from its appearance, which is like melted glass. It is neither so hard as the crystalline, nor so liquid as the aqueous, but like both the others serves to collect the rays passing through it, to a point. As the rays of light passing from any object to the retina of the eye, are conveyed to a point, by means of the several humours, and then again diverge a little,

it is evident that the image is formed upon the retina in an inverted position; but this makes no difference with the perception of the person, for as we become accustomed from our earliest infancy to the manner in which we see objects, we learn to judge of the position of objects just as well as if their image was received upon the retina directly, the reverse from what it is.

The ball of the eye is situated in a bony cavity, by which it is well protected against ordinary accidents, from blows, &c.: it is also well sheltered by the eyebrows, which prevent the sweat of the forehead from running down into it; and it is also further protected by the eyelid which can be drawn over it with instantaneous rapidity on the approach of danger. This lid also serves to wipe from it all superfluous moisture, and it at the same time distributes over it that which it requires, it also covers, and protects it during sleep. In the upper part of its orbit the eye is furnished with a gland, for supplying it with the necessary moisture, and also with a duct called the *lachrymal duct* through which this moisture is conveyed to the nose.

Such is the general outline of the structure of the eye, an organ which is most admirably and curiously formed, and which probably affords us more pleasure and enjoyment than that of any other with which we are endowed; indeed, without this organ, how dismal and wretched would be the lot of man! instead of a blessing, life, under such circumstances, would be the greatest of evils.

Since writing the above, we have accidentally picked up the following account of an operation by which sight was restored to an eye by means of supplying an artificial *aqueous* humour, in the place of that which was lost, and as it is appropos to the subject, we present it to our readers.

"M. Maunoir, Professor of Surgery at Geneva, having performed the operation for cataract, by extraction, upon a man 82 years of age, weakened by an operation of hernia, which he had endured six weeks before, perceived to his regret, that although the pupil remained beautifully black and perfectly in tact, the anterior and posterior chambers of the eye were not replenished, the cornea became sunk and wrinkled, a few bubbles of air penetrated the anterior chamber, and the patient had no vision. Without yield-

ing to the first melancholy impression, the operator, by a happy presence of mind, conceived the hopes of filling the cavity: he sent immediately for some distilled water, warmed it, placed the patient on his back, and filled the external orbit of the eye with the water, opened the eyelid, and raised the flap of the cornea. The water then penetrated into all the accessible cavities, the folds of the cornea disappeared, and its convexity was restored. Having kept the eye shut for some minutes, he then directed the patient to open it, and found it in the most satisfactory condition; the patient distinguished all the objects presented to him as well as after the most successful operation. A slight pain was felt after the introduction of the water, which went off after a short time. From that time the eye healed without difficulty, and when opened, a week after the operation, it was free from swelling and inflammation; the cornea was perfectly united, but the pupil was a little obscure, the sight feeble, and the patient complained that he did not see so well as immediately after the operation. But six days after the bandage was removed, the shade of the pupil was much diminished, the sight grew stronger from day to day, and no doubt was entertained that the patient would soon be able to read common print."

COFFEE.

The general effect of coffee upon the nervous coat of the stomach is, unquestionably, a gentle stimulant; and as most substances of that class have to a certain extent, a tonic power, it may be safely recommended to individuals whose power of digestion have been debilitated by stimulants of a more powerful character, such as fermented liquors, wine, spirits &c. The custom of taking coffee after a late dinner, and just before retirement to rest is bad; because its stimulant property upon the nerves of the stomach exerts a power destructive to sleep; it promotes an activity of the mind, and gives a range to the imagination, which prevents self-forgetfulness, that sure harbinger to repose.—*Manuel of Invalids.*

CHLORINE.

It is said that the most beneficial effects have been produced in pulmonary complaints by injections of chlorine. A physician in Paris has invented an instrument for the purpose.

A WORD TO THE MECHANICS OF NEW-YORK.

To the Editors of the Magazine of Useful Knowledge.

GENTLEMEN—I am a constant reader of your useful and entertaining work, and take the liberty of telling you that I think it will do much good among the class of men that I belong to. I am a mechanic, and a *working* one too, and have but little time to read, and I therefore endeavour to read that which will be of some use to me. Now I will tell you how I do :—When I have done my work, in the evening I feel pretty tired, and don't feel like taking a large book, and sitting down to read a long piece, for then I am sure to get sleepy ; but your Magazine has so many little, short articles in it that are all useful and entertaining, that I take that up, and read and learn something , but I always find that I have read more, come to put it all together, than I expected to, and that when it is time to retire, I feel quite refreshed, both in body and mind. I do not know how it is, but I always feel more cheerful after reading something agreeable in your Magazine, or some other useful and interesting work, than I did before. From such kind of works I always get something to think of when my mind is not engaged in my business. I know some mechanics who say they never want to think of any thing but their business, but I am not one of these, nor do I wish to be, for I find these never know any thing but just what relates to their own particular business—of every thing else they are as ignorant as horses.

I have an idea that a *Mechanic's Reading-Room*, which should be furnished with a variety of periodical works, of the right kind, would be a very excellent thing in this city : it would draw the mechanics more together, make them acquainted with each other, and it would enable each subscriber to read a great number of useful books and periodicals for the same price that they would otherwise have to give for one. Now, as your Magazine is read by a great number of the mechanics in this city, I should be glad if you would encourage an establishment of this kind.

A JOURNEYMAN MECHANIC.

We embrace the opportunity which the foregoing letter from "*A Journeyman Mechanic*" gives us of saying a few words to the

Mechanics of this city: and in the first place we must express our surprise that so numerous and respectable a body of men should have so long neglected to establish an INSTITUTION worthy of themselves, and of the enlightened age in which they live. Such an institution would be a most valuable acquisition to the city, and could not fail, if properly conducted, to raise the moral and intellectual character of its members to that standard which would secure that respect from, and influence among, their fellow-citizens, which wealth alone can never command.

There is scarcely a large city or village in the union, except the *largest*, where a Mechanics' Institution is not established, in which lectures are delivered during the winter months. Lord Bacon well remarked that "Knowledge is Power:" if this were true two hundred years ago, and in a monarchical government, it is certainly not less so at the present day, and in a country whose government is based upon the intelligence of the people. It is the law of mind, as it is of matter, that the most powerful shall control the weaker: this is the immutable law of nature, which ever has, and ever will exist; it is exemplified in the control which the civilized man obtains and exercises over the untutored savage, and the deference which the ignorant always pay to superior intelligence. If, then, the mechanics of this city would possess an influence in society due to their numbers, wealth, and enterprise, they have only to acquire and disseminate useful information; and nothing would, in our opinion, more effectually do this than the establishment of an institution in which popular lectures on History, Mechanics, Chemistry, &c. &c. should be delivered, and to which should be attached a library and reading-room, well supplied with a good selection of books and periodical publications.

We know of several gentlemen whose talents and scientific attainments qualify them for the task, who would readily, for a small compensation, deliver a course of lectures to an association of mechanics, were such a one formed; and we believe there are many mechanics in the city who, were some active man to go forward, would unite heart and hand in establishing such an Instution.

CAMERA LUCIDA.

By the application of a simple principle in optics, Dr. Woolaston has succeeded in constructing an instrument which is admirably adapted to the purpose of copying drawings, or obtaining a perfect outline of real objects. The Camera lucida is superior to all other inventions of this kind, and is of so easy management that it may be used by any one however unacquainted with the art of drawing, and the artist by its means may attain an accuracy of outline which the most practiced hand could not arrive at without great expense of labour and time. Its size renders it extremely portable, the glass prism which forms the reflecting part of the instrument, not exceeding one inch, and it may be mounted on a folding stem, so that the whole may be carried in the waiscoat pocket. It is invaluable to all those who are desirous of procuring correct copies from drawings, or perfectly precise delineations of natural or artificial objects. As a labor-saving machine, it may be recommended even to the most skilful draftsmen. It is admirably fitted to the art of engraving, as drawings may by it be reduced or enlarged in any required proportion, and the outline so reduced may be immediately traced on the copperplate with the greatest facility. Lithographic drawings, and draughts for wood-cuts, can be also made on the stone or blocks, without any intermediate preparation, and the artist would be insured by the instrument against any deviation from his original, which he would be apt to be led into by trusting solely to his eye. Landscapes and natural scenery can be sketched by it with the utmost precision, and the traveller would find it a most valuable companion for drawing with ease the views of nature which he is desirous of remembering. The naturalist, in particular, will find it an indispensable assistant in delineating all such natural objects as can be rendered stationary.

THE DEAD SEA.

From Madden's Travels.

About 6 in the morning I reached the shore, and much against the advice of my excellent guides, I resolved on having a bath. I was desirous of ascertaining the truth of the assertion, that 'nothing

sinks in the Dead Sea.' I swam a considerable distance from the shore; and about four yards from the beach I was beyond my depth—the water was the coldest I ever felt, and the taste of it the most detestable; it was that of a solution of nitre, mixed with an infusion of quassia. Its bouancy I found to be far greater than that of any sea I ever swam in, not excepting the Euxine, which is extremely salt. I could lie like a log of wood on the surface, without stirring hand or foot, as long as I chose; but with a good deal of exertion I could just dive sufficiently deep to cover all my body, when I was again thrown on the surface, in spite of my endeavours to descend lower. On coming out, the wounds of my feet [which had been previously made] pained me excessively: the poisonous quality of the waters irritated the abraded skin, and ultimately made an ulcer of every wound, which confined me fifteen days in Jerusalem; and became so troublesome in Alexandria, that my medical attendant was apprehensive of gangrene.

Dr. Madden is convinced that no living creature can be found in the Dead Sea, and to try whether there were any fish in it, he spent two hours in fishing. The surface of this sea is covered with a thin pellicle of asphaltum, which issues from the fissure of the rock adjoining it. On coming out of the water he found his body covered with it, and likewise with an incrustation of salt, almost the thicknes of a sixpense.

The rugged aspect of the mountains, the deep ravines, and the jagged rocks, all prove that the surrounding country has once been the scene of some terrible convulsion of nature. "I have no hesitation," says Dr. Madden, "in saying, that the sea which occupies the site of Sodom and Gomorah, Adam, Leboiam, and Segor, covers the crater of a volcano.' A bottle of the water which he brought home with with him, on being analyzed, was found to contain the following substances, namely:

Chloride of Sodium, with a trace of Bromine,	9.58
Chloride of Magnesium, - - - -	5.28
Chloride of Calcium, - - - - -	3.05
Sulphate of lime, - - - - - -	1.34
	19.25

The most extraordinary circumstance relating to this sea is, that there is no visible outlet to it; and notwithstanding the river Jor-

dan, according to the estimates of Dr. Shaw, empties into it daily, six millions and ninety thousand tuns of water, there is never any visible increase or diminution in its height. Its greatest breadth does not exceed ten miles, and its extreme length is about seventy.

NEW PUBLICATIONS.

France in 1829 *and* 30. *By Lady Morgan, in two volumes.*

We are much indebted to the enterprising publishers of this work for the no small share of pleasure its perusal has afforded us. We sometimes like the "*utile cum dulce*"—the poetry and prose of life, the wit and humour of man, and sometimes the vivacity, quickness, and even the philosophy of woman. We fear no short frocks and azure hose, now-a-days; man is too jealous of his superiority to be put entirely in the shade, unless he deserves the second place. Of a rainy, "blue-devil sort of a day, we like to sit down to a *melange* of fiction and philosophy, logic and loquacity, character and criticism, manners and memoirs—in short, just such a salmagundi as Lady Morgan has served up in her "FRANCE." She says *what* she thinks and *as* she thinks: good humour, wit, repartee, nationalities, egotisms, politics, morals—every thing, finds a place in her book, and is given in an agreeable style—we seem, while reading, to be holding a sort of tete-a-tete conversation with Lady Morgan herself: this we like: it is "the useful with the pleasant." France should be better known by Americans—the fire-side, the closet, the street, the croud, the city, the country, the men, the women, the children, individually and collectively. Give us these in the dress of nature, and we will laugh while we derive profit from the representation. We can, moreover, gather much from this chimney-corner sort of book that will aid us in tracing the late revolution to its true causes. This mighty movement of an empire was the offspring of no ephemeral politician, nor the effect of a foolish dictum of a more foolish king, but the result of the general diffusion of intelligence. The French community has been for some time moving on in the rail-car of knowledge, and when men learn to *think* for themselves, they soon learn to *act* for themselves, and *govern* themselves, whether

right or wrong, wisely or unwisely. This is strikingly exemplified by the French nation.

Speaking of French writers, the authoress says, "Measures, not men—things, not theories—the public good, and not the public amusement—prose, not poetry, pre-occupy attention, and modify the manifestations of individual genius."

"The abnegation of self, the abandonment of the paltry *gloriale d'auteur*, is a necessary sacrifice, cheerfully encountered by the young literati of the present day; and the ambition to be useful to the many, has superseded the desire of writing for the refined and fastidious few." If these remarks be true, no wonder France is free.

There are some passages in the book which we do not much like; but we would say to all, "read it, if you wish to be amused and instructed."

We would gladly quote several passages from the work, did our limits permit, but we must confine ourselves to the following, which relates to him "whose history is the common property of all civilized nations."

"The mind of Lafayette, brightening like a fine coin by the friction of use, has come out on every occasion on which the liberty of the people has called for his exertions, with a strength beyond that even of his first youthful vigour. He has resisted the various attempts made upon the freedom of the press, and on the purity of election, with the same firmness that has distinguished all his votes, and with the same tenacity to original principles with which he started for the goal of immortality. His attendance on the duties of the chamber of deputies, strange as that fact may appear to very many of the honourable members of another legislative assembly in another country, is constant and unwearied, as if age could not enfeeble his body, nor disgust nor langour assail his mind. Without the walls of the chamber, his influence is even more decided than within. He is indeed the centre upon which the whole liberal opposition moves—the guide to whom the youth and the aged alike turn with confidence and affection. His ascendency is not obtained by flattering the multitude—it is not purchased by violence and exaggeration. It is not even the result of those all-commanding talents which are occasionally found unconnected with honesty or judgment. He has not the eloquence of a Mirabeau, the brilliancy of a Canning, the financial capacity of a Necker, nor the political philosophy of a Romilly or a Bentham. His persuasive power is the force of good sense and self-conviction—the clearness of his views, and the earnestness with which he expresses them. In one word, it is the *force of honesty*, of *public virtue*, and of

private worth; and if in the violence and storm of human passions, amidst the tornado of a revolution, this force has been too frequently borne down by qualities more imposing, and by volitions more violent, yet, *in the long run* of political life (to the credit of human nature be it observed) there is no more powerful engine for moving the public, for accomplishing useful ends, and for benefically influencing the destinies of nations, than tried probity and proud consistency, in which the confidence of a people have long reposed."

Would to God that the world, and our *own* country in particular, could boast of more of this kind of politicians, or rather statesmen—would to God that all who aim to acquire fame and distinction, might be convinced that that only is worth possessing which results from *tried probity, proud consistency, pablic virtue,* and *political honesty.*

Give us honest, intelligent, upright men—men who will sacrifice their own individual interests upon the shrine of their country's welfare, instead of those who endeavour to promote their own views at the expense of public good, and our republic is safe, safe beyond the reach of political tempests—safe *forever.*

MONTHLY LIST.

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ERRATA.

In Page 171, line 2d, for ascetic read *acetic*. 211, line 5th, for their read *these*. 212, line 1st, for their read *these*. line 6th, for form read *force*. line 37th, for where read *which*. 213, line 12th, for rising read *wing*. 318, line 27th, for vanity read *unity*. 319, line 2d, for Hale read *Hall*. line 6th, for miles read *mills*. 358, line 29th, for wants read *events*. 359, line 6th, for zine read *zinc*. 360, line 30th, for gazes read *gases*.

END OF THE FIRST VOLUME.